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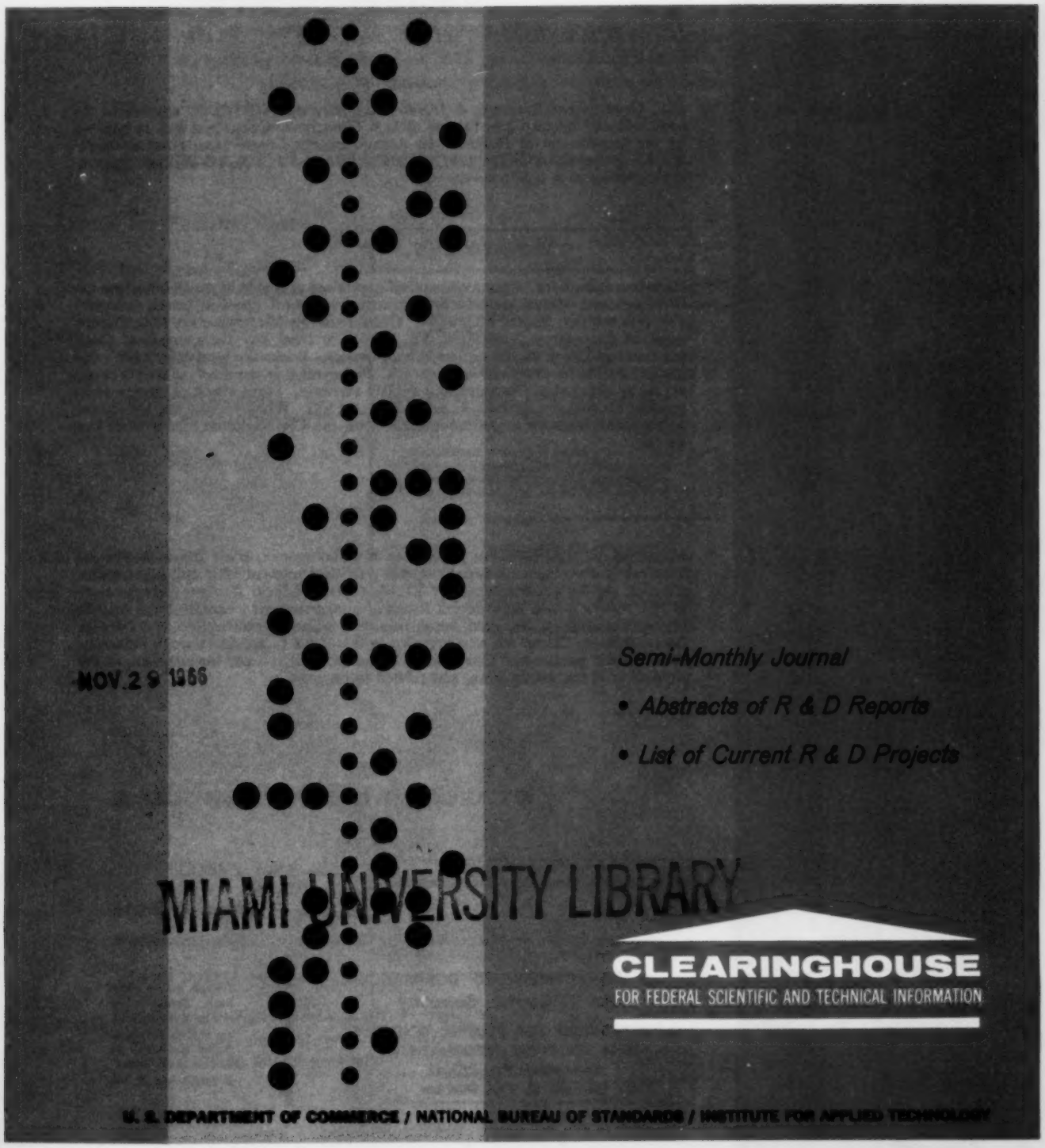
U.S. GOVERNMENT

RESEARCH & DEVELOPMENT REPORTS

November 10, 1966



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Semi-Monthly Journal

- *Abstracts of R & D Reports*
- *List of Current R & D Projects*

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U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

November 10, 1966 / Volume 41, Number 21

U.S. Government

RESEARCH AND DEVELOPMENT REPORTS

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PURPOSE

U.S. Government Research & Development Reports (USGRDR) announces the availability of selected new reports of U.S. Government-sponsored R & D released by the Department of Defense, the Atomic Energy Commission, National Aeronautics & Space Administration, and other agencies. It also lists current Government-sponsored R & D projects.

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INDEX

All entries in USGRDR are indexed in the *Government-Wide Index to Federal Research & Development Reports (GWI)* published semi-monthly and sold on subscription by the Clearinghouse at $22.00 a year ($27.50 foreign). Single copy $1.75. Indexing data from recent issues of announcement journals of the Atomic Energy Commission, National Aeronautics and Space Administration, and Defense Documentation Center are also included in this index to provide a single reference guide to new unclassified Government-sponsored research and development in the physical sciences, engineering, and related technology.

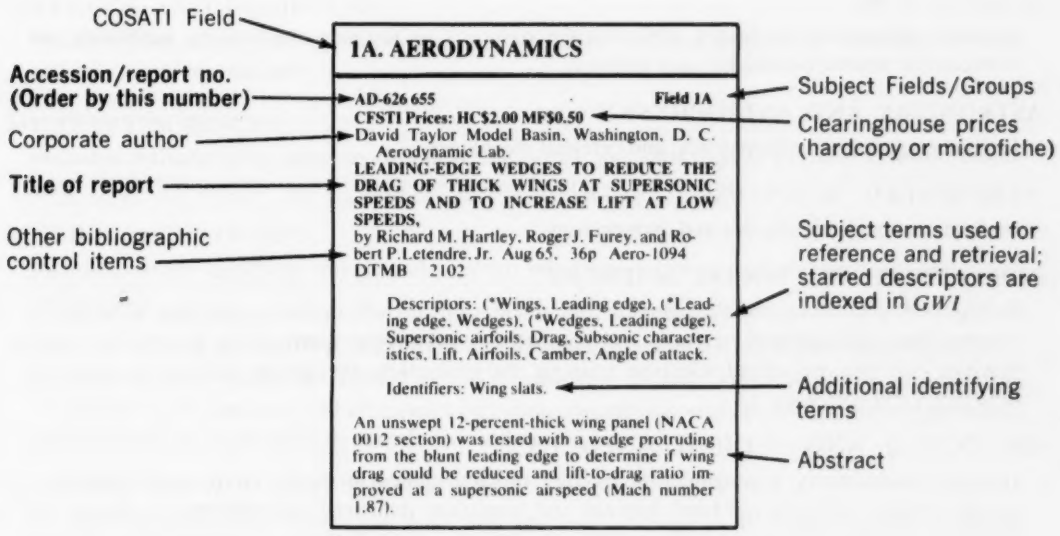
U.S. DEPARTMENT OF COMMERCE
John T. Connor, Secretary
CLEARINGHOUSE FOR FEDERAL SCIENTIFIC
AND TECHNICAL INFORMATION
Springfield, Va. 22151
Bernard M. Fry, Director

Contents may be printed freely. Mention of source will be appreciated.
Use of funds for this publication approved by the Director of the Bureau of Budget, June 22, 1966.

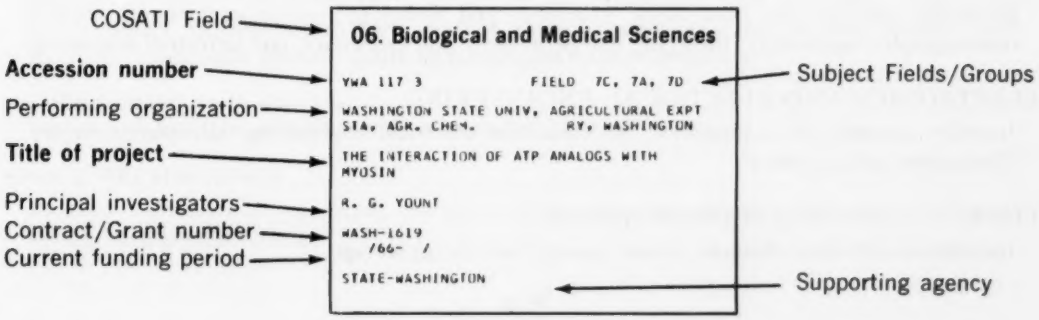
USGRDR FORMAT

Entries are arranged under 22 subject categories called FIELDS. In the entry, subcategories called GROUPS and occasionally sub-groupings are also indicated. This system was adopted by the Committee on Scientific and Technical Information (COSATI) of the Federal Council on Science and Technology. The COSATI Subject Category List, AD 612 200, is available from the Clearinghouse at $1.00. Documents are listed alphanumerically (that is, alphabetic data precedes numerical data) by accession/report number. Key segments of information contained in the entries are identified diagrammatically below.

● RESEARCH & DEVELOPMENT REPORTS


COSATI Field
1A. AERODYNAMICS
Accession/report no. (Order by this number)
AD-626 655
Field 1A
Subject Fields/Groups
CFSTI Prices: HC$2.00 MF$0.50
Clearinghouse prices (hardcopy or microfiche)
Corporate author
David Taylor Model Basin, Washington, D. C. Aerodynamic Lab.
Title of report
LEADING-EDGE WEDGES TO REDUCE THE DRAG OF THICK WINGS AT SUPERSONIC SPEEDS AND TO INCREASE LIFT AT LOW SPEEDS,
Other bibliographic control items
by Richard M. Hartley, Roger J. Furey, and Robert P.Letendre, Jr. Aug 65. 36p Aero-1094 DTMB 2102
Subject terms used for reference and retrieval; starred descriptors are indexed in GWI
Descriptors: (*Wings, Leading edge), (*Leading edge, Wedges), (*Wedges, Leading edge), Supersonic airfoils, Drag, Subsonic characteristics, Lift, Airfoils, Camber, Angle of attack.
Identifiers: Wing slats.
Additional identifying terms
An unswept 12-percent-thick wing panel (NACA 0012 section) was tested with a wedge protruding from the blunt leading edge to determine if wing drag could be reduced and lift-to-drag ratio improved at a supersonic airspeed (Mach number 1.87).
Abstract

● CURRENT R & D PROJECTS



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01 AERONAUTICS 1
Includes aerodynamics; aeronautics; aircraft; aircraft flight control and instrumentation; and air facilities.

02 AGRICULTURE 8
Includes agricultural chemistry; agricultural economics; agricultural engineering; agronomy and horticulture; animal husbandry; and forestry.

03 ASTRONOMY AND ASTROPHYSICS 8
Includes astronomy; astrophysics; and celestial mechanics.

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Includes atmospheric physics and meteorology.

05 BEHAVIORAL AND SOCIAL SCIENCES 21
Includes administration and management; documentation and information technology; economics; history, law and political science; human factors engineering; humanities; linguistics; man-machine relations; personnel selection, training, and evaluation; psychology (individual and group behavior); and sociology.

06 BIOLOGICAL AND MEDICAL SCIENCES 42
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Includes conversion techniques; power sources; and energy storage.

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special ANNOUNCEMENTS

CURRENT R and D SECTION TO BE DISCONTINUED

The Clearinghouse will suspend publication of the 'Current Research and Development Projects' section after the December 25, 1966, issue of USGRDR.

The present concept of publishing information on unclassified research and development in progress is being restudied by the Clearinghouse in an effort to determine the best way for expanding and improving the format for announcement to the industrial and scientific community.

While the study is underway, information on such research can be obtained from the Science Information Exchange of the Smithsonian Institution, where Federal agencies report their new research projects.

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RESEARCH highlights

Reports of current high industrial interest

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Management Control, Decision Systems

STATE TECHNICAL SERVICES GUIDE TO TECHNOLOGY TRANSFER AND INNOVATION

(Order Stock No. PB-170 991 Technology Transfer and Innovation, A Guide to the Literature, HC $3.00/MF 50 cents.)

The latest in a series of publications released to the public by the U. S. Department of Commerce's Office of State Technical Services is a guide to the literature on technology transfer and innovation. Prepared by the Department's Clearinghouse for Federal Scientific and Technical Information, the guide is designed to assist State organizations in the implementation of the State Technical Services Act of 1965.

Technology transfer - sometimes called 'spin-off' - is the application of technical knowledge in an area other than its field or place of origin, especially

as used by industry in solving production problems, instituting new techniques, and developing new products. For instance, systems analysis as practiced in the aerospace industry or the Space Agency being applied to microelectronic circuity; radionuclide production by the Atomic Energy Commission's atom smashers and nuclear reactors being used by cancer research laboratories; or advanced valve technology developed for space vehicles being used in chemical plants.

If transfers such as these are made successfully, innovation follows as a matter of course. These two subjects are therefore treated as integral parts of the process of technological change.

The STS publication contains two major sections. A review section categorizes and highlights ideas contained in the literature. A bibliography section cites and summarizes the literature as it has appeared in scientific and business journals as well as relevant Government reports.

The review section is in four parts: (1) aspects of technological change as reflected in the literature; (2) information on transferring space and military technology to industry; (3) factors that encourage innovation; and (4) an outline of congressional hearings regarding problems associated with technology transfer.

Among the several aspects of technological change noted are the relationship to economic planning; to the production of new kinds of goods and services; the role of the Federal Government in technological forecasting; the problems involved in channeling new technology in promising directions; and the influence on local and regional development and on the businessman. The latter must possess a keen awareness, sensitivity and receptivity to technological change if he is to be successful, according to Dr. James R. Bright of the Harvard Business School. Dr. Bright views technological change as the most important factor in the business environment with its power continuing to grow.

Universities can create the incentives to technological growth; they should be regarded as community-oriented institutions concerned not merely with training and developing engineers and scientists as manpower products. They should also be involved with the solution of regional and local economic problems through the application of technology.

Data Processing

READOUT SYSTEM DESIGNED FOR TELEMETRY

(Order Stock No. N66-19758 Telemetry Data Frame Readout System, HC $1.00/MF 50 cents).

An instrument designed by the Space Agency satisfies the need of modern digital telemetry systems for improved methods of monitoring large quantities of digital

information during the design and testing phases of many programs. It was devised in conjunction with the NIMBUS B, IRLS (Interrogation Recording and Location System) experiment design. With the exception of complex data handling equipment, devices used in present-day practice are inherently slow, making data analysis very time consuming. Therefore, an instrument which provides a high data handling capability combined with a convenient display technique is highly desirable. The NASA device provides a means of visually displaying, in numeric form, the ones and zeros contained in a serial pattern of binary bits, formatted into a frame containing up to several hundred bits. The result of this innovation has been a great saving in both time and expense, since system operation can be quickly and accurately checked for bit errors or other malfunctions in discrete system components or in the RF link.

BASIC PROGRAMMING KNOWLEDGE TEST DEVELOPED

(Order Stock No. AD-636 988 Computer Personnel Selection and Criterion Development: Vol. III, The Basic Programming Knowledge Test, HC $2.00/MF 50 cents. Earlier reports in this series are: AD-299 244, Same Title: Vol. I, The Research Plans, in HC only, $7.60; and AD-432 020, Same Title: Vol. II, Description and Classification of Computer Programmer and Analysts Jobs, in HC only, $10.10.)

A basic programming knowledge test developed by the University of Southern California's Department of Psychology tests an individual's knowledge of the basic principles and techniques of programming. The University's report on the BPKT is one of a series on the criterion development phase of a long-term research program concerned with computer personnel selection and evaluation. The BPKT is intended to stand by itself as a criterion of programming proficiency. Test questions were selected meeting the criteria of discrimination and appropriate difficulty, as indicated by the statistical analysis of results of a large preliminary testing. The final form of the test consists of 100 multiple-choice questions that are designed to be free of references to specific computers and languages now in use. The BPKT was planned to meet three needs. It is an instrument to use for selecting experienced personnel. It provides a method to assist in classifying, evaluating, and upgrading programmers and analysts. And it is an objective, reliable research instrument to be used in validating aptitude tests or other predictors.

Electronics

ELECTRON BEAM WELDING FOR FABRICATING TUBE MATERIALS

(Order Stock No. AD-635 870 Electron Beam Techniques for Fabrication and Assembly of Parts for Electron Tubes, HC $7.00/MF $1.75).

Higher per-piece production rates can result when electron beam welding is used for fabricating and assembly of parts for electron tubes rather than other

processing techniques. According to an RDT and E program performed by Hamilton Standard, electron beam welding used in place of brazing, TIG welding, and mechanical staking in many areas in tubes also resulted in a zero rejection of electron beam welds except in those cases wherein the joint design and materials required fixtures of sophistication beyond the scope of the program. The preparation and evaluation of the engineering sample tubes permitted successful manufacture and delivery of type 6544 and type 6914. Other conclusions regarding fabrication of metallic tube materials used in electron tube manufacture are: (1) optimum joint strengths approaching that of the base metal probably can be produced for each of the wire-to-copper joint combinations studied, with the possible exception of the large diameter (0.050 inch and greater) molybdenum and tungsten wires; (2) weldments involving Mo and W were most susceptible to failure in shock, impact-in-tension, and repeated-load bending, but were apparently not seriously affected by vibration; (3) all other welded joints did not seem to be affected by shock, vibration, or impact-in-tension; (4) all lap-joint weldments were more susceptible to earlier failure under repeated load bending than the base metal because of a reduction of ductility in the fusion zone; and (5) the electron beam process could drill holes from 0.0005-inch diam. through materials ranging from 0.001-inch to 0.025-inch thick. Holes could be drilled at practical production rates, with good reproducibility, and a heat-affected zone is virtually nonexistent after drilling.

SYMPOSIUM PAPERS ON ELECTRONICS PHYSICS OF FAILURE

(Order Stock No. AD-637 529 Physics of Failure in Electronics, Volume 4, HC $9.65/MF $2.75).

The Proceedings of the 1965 Symposium on the Physics of Failure in Electronics have now been published as part of the Rome Air Development Center's Reliability Series. This fourth of an annual series of conferences was held at the Illinois Institute of Technology, Chicago, November 16-18, 1965, and was sponsored jointly by RADC and the IIT Research Institute. The purpose of the meeting was the same as that of previous years: to provide an exchange of views on the sources and nature of the basic mechanisms which contribute to degradation, aging, and failure of electronic parts and materials. Emphasis was on the application of this information to the problems of reliability control, measurement, prediction, and improvement. The meeting also served as a forum for physicists, chemists, metallurgists, and electronics engineers to discuss their findings with those charged with designing, developing, and demonstrating the reliability of electronic devices. In six sessions, 29 papers were presented on Interconnections; Test, Analysis, and Correlation; Device Physics; Surface Effects; Bulk Effects; and the Minuteman II Component Quality Assurance Program.

Information Technology

OAK RIDGE DESIGNS SUPERIOR MICROFICHE ENLARGER

(Order Stock No. ORNL-TM-1490 Design of a Step-and-Repeat Microfiche Enlarger, HC $1.00/MF 50 cents.)

The AEC's Oak Ridge National Laboratory has designed an enlarger for in-plant use to make hard copy from COSATI specification microfiche. The step-and-repeat feature was developed because enlarging has previously been time consuming in locating and masking each frame and printing each frame manually. The new enlarger has a low construction cost, ease and simplicity of operation, and greater speed in exposing and processing. It gives good quality prints for line and halftones. ORNL's report is highly illustrated and gives construction details.

VIETNAMESE-ENGLISH DICTIONARY PUBLISHED

(Order Stock No. TT-66-34129, JPRS:37,700 Vietnamese-English Dictionary, Vols. I and II, HC only, $18.00 a set.)

A Vietnamese-English dictionary has been published by the Joint Publications Research Service, U. S. Department of Commerce. The dictionary contains 65,000 entries representing more modern usage than any currently available dictionary, particularly in regard to terms used in North Vietnamese publications. A JPRS team of Chinese and Vietnamese linguists prepared the new work by translating the Chinese entries in Tu Dien Viet Han (Vietnamese-Chinese Dictionary), compiled by a Communist Chinese commission and published in Peiping in 1960. The JPRS dictionary includes monosyllabic words, phrases, idiomatic expressions, colloquial phrases, and foreign words. It also incorporates the more common 'post-liberation' terms and general scientific and technical terms. Some common words taken from southern Vietnam and central Vietnam dialects are also entered and explained. Most of the entries are based on phonetic symbols of the ordinary pronunciation. JPRS indicates that although the Communist Chinese dictionary on which their work is based is not the product of a long-term scholarly effort, the JPRS linguists have tried to verify all entries in an attempt to improve the original and to fill some of the gap in badly needed reference tools for working with original Vietnamese language materials.

FULLY AUTOMATIC INFORMATION RETRIEVAL SEEN POSSIBLE

(Order Stock No. PB-173 196 Information Storage and Retrieval, HC $7.00/MF $1.75).

The construction of a documentation center operating with fully automatic information retrieval techniques seems well within the possibilities of present-day knowledge and technology, according to a study made by Cornell University's Department of Computer Sciences. In a report to the National Science Foundation, Cornell also suggests that future information centers will make use of automatic text analysis rather than manual subject indexing. Among the techniques likely to be implemented in practice are the synonym recognition and phrase generation methods made possible by thesauruses and phrase dictionaries, and the statistical term-term association procedures. Document identifiers may be expected to be based on document abstracts, or longer document excerpts, and weights will be assigned to improve retrieval performance. These are several conclusions reached by the Cornell group in its latest in a series of reports on the fully automatic document retrieval system SMART that operates on an IBM 7094 computer

under a normal FORTRAN II monitor system. The SMART system is a fully-automatic document retrieval system, capable of processing on the 7094 search requests and documents available in English, and of retrieving those documents most nearly similar to the corresponding queries. The machine programs consist of about 150,000 program steps and can be used not only for language analysis and retrieval, but also for the evaluation of search effectiveness by processing each search request in several different ways while comparing the results obtained in each case. The Cornell study reports on work in three main subject areas: automatic and semi-automatic dictionary construction, evaluation output based on results obtained by processing four document collections in three subject areas, and iterative search experiments based on user feedback.

LATEST INDEX TO NASA'S TECH BRIEFS

(Order Stock No. NASA SP-5021(03) Index to NASA Tech Briefs, HC $1.00/MF 75 cents.)

The index for January-June 1966 Tech Briefs supplements the Cumulative Index of February 1966. It lists the technological innovations published in this form for five categories: Electrical (including Electronic), Physical Sciences (Energy Sources), Materials (including Chemistry), Life Sciences, and Mechanical. (Annual subscriptions to Tech Briefs in all five categories may be purchased from the Clearinghouse for $20.00. Annual subscriptions by subject category are: Electrical, $6.00; Physical Sciences, $2.50; Materials, $5.00; Life Sciences, $2.50; and Mechanical, $6.00. Individual briefs are also available for 15 cents each. For those Tech Briefs issued prior to January 1966, the price is $30.00 per set.)

Mechanical Equipment

DESIGNERS OF MECHANICAL SYSTEMS USE NEW APPROACH

(Order Stock No. AD-637 599 Optimum Mechanical Design Synthesis, Volume I, HC $4.00/MF 75 cents; and AD-637 595 Bibliography of Optimum Mechanical Design Synthesis, Volume II, HC $21.38/MF $5.25.)

A new approach to the design of mechanical systems and elements based on initially determining the characteristics of the optimum fabricable mechanical configuration has been developed at the Illinois Institute of Technology. The classical idea of mechanical design being a repetitive, trial and error process is discarded in favor of acquiring information on the best possible design before giving any consideration to the conception of a fabricable mechanical design. The IIT study investigates techniques which would permit the design process to be placed on a more quantitative basis than is possible with the usual trial and error procedure. The initial effort of the project was to conduct a literature survey of optimization and synthesis techniques which might be applied to mechanical design. The results of this survey were placed in an annotated/automated bibliography which is Volume II of the IIT report. IIT's work explores several

techniques, including control theory computational approaches such as dynamic programming, for mechanical design and to determine the promise or difficulties to be expected in future use. Description of the techniques appropriate for the new approach are presented in handbook form and recommendations are made as to the course ensuing efforts should take in the field of optimal mechanical design synthesis.

FOREIGN MARKET SURVEYS AVAILABLE

(Order Stock No. PB-170 951 Packaging Machinery and Equipment in France, HC $2.00/MF 50 cents; PB-170 947 Advanced Metalworking Machine Tools and Accessories in the Federal Republic of Germany, HC $3.00/MF 75 cents; PB-170 950 Plant and Equipment Maintenance Apparatus and Products in Italy, HC $2.00/MF 50 cents; PB-170 948 Material Handling and Conveying Equipment in Italy, HC $3.00/MF 50 cents; and PB-170 955 Materials Handling Equipment in Japan, HC $6.00/MF $1.50.)

These Foreign Market Surveys have been prepared by overseas market research firms for the Business and Defense Services Administration, U. S. Department of Commerce. The surveys are part of a United States program to help U. S. firms initiate, develop, or expand their exports. They are detailed studies of the market for specific commodities and cover a variety of equipment and machinery.

AUSFORMED BEARING COMPONENTS HAVE LONG FATIGUE LIFE

(Order Stock No. AD-637 576 The Production, Testing and Evaluation of Ausformed Ball Bearings, Final Engineering Report, HC $4.00/MF 75 cents.)

Bearings with ausformed M-50 inner rings and balls have fatigue lives nine times greater than bearings having standard heat-treated components, according to General Electric metallurgists. New manufacturing techniques developed by GE for ausforming small to medium sized rolling element bearing components indicate this 900 percent greater fatigue life in tests under like conditions of speed and load and with the same lubricant. Of great significance in the quest for 'super' bearings, ausforming is a process involving the working of steel while it is in a metastable austenitic condition. It gives remarkable strength increases in high speed tool steels. GE's study of the ausforming process began in 1958 when it became evident that ausforming offered an extremely attractive opportunity for improving the reliability of rolling-element bearings by improving their rolling contact fatigue properties, fatigue being the primary failure mechanism in bearings.

According to GE, 'The demonstration of the improved life capability of ausformed bearings now makes it feasible to begin phasing these into critical applications where bearing life is presently marginal or unacceptable. With the present state-of-the-art, the initial applications should be limited to the smaller size bearings up to and including 50 mm bore. Additional manufacturing development is necessary to scale this process up to large-main shaft size bearings

ranging in size from 120 mm to 240 mm bore.' GE notes that the major effort required is primarily one of defining ausforming procedures based on metal working equipment capability and availability. 'While the present program was aimed at ball bearing applications,' the report adds, 'there is no reason why ausformed roller bearings cannot be produced today in the size ranges possible with ball bearings. In fact, a roller bearing would be considerably less difficult to produce in view of the more straightforward dimensions of the raceways and the simple shape of the rolling element.'

Metals, Nonferrous and Alloys

NEW COMPOSITES HAVE POTENTIAL FOR HIGH TEMPERATURE BEARINGS

(Order Stock No. NASA TN D-3484 Self-Lubricating Composites of Porous Nickel and Nickel-Chromium Alloy Impregnated With Barium Fluoride-Calcium Fluoride Eutectic, HC $1.00/MF 50 cents.)

Two types of self-lubricating composite materials developed at NASA's Lewis Research Center have a potential use in high-temperature bearing and seal applications. The composites were prepared by vacuum-impregnating porous nickel or nickel-chromium alloy with a barium fluoride-calcium fluoride eutectic composition to completely fill all voids. Low wear rates during service up to 1100°F, in air for the nickel and to 1350°F. in air and 1500°F. in hydrogen for the nickel-chromium composites together with improved mechanical strength permit extension of self lubricated bearings to higher temperatures and loadings. The frictional properties of the composites were significantly improved by the application of a thin, sintered coating of eutectic fluoride to the bearing surfaces.

Transportation (Land, Sea, Air, Space)

SIMPLE COMPUTER SYSTEM AVAILABLE TO TRANSPORT INDUSTRY

(Order Stock No. PB-173 016 User's Manual -- TRANSIM, General Purpose Transportation System Simulator, HC $6.00/MF $1.25; and PB-173 017 Deck of Cards to Feed the Required Information Into the Computer, HC $17.00.)

A new, simplified, plain language method in computer simulation for the transportation industry requires no glossary, no special vocabulary, no list of definitions, no abstract language, and no short course for its operators. Known as TRANSIM (for transportation simulator), the system was developed for the Department of Commerce by the University of California at Los Angeles.

It is described as closing 'a communications gap between the analysts and management,' making it possible for transportation management officials to simulate transportation problems for all systems of transport -- rails, trucks,

airlines, ships, pipelines, etc.--without special training in computer technology.

A report on the TRANSIM system says all that is necessary to set up a typical problem for simulation is to fill out standard input data forms. No computer programming is required. 'These forms call for data that describe the problem situation in terms of the operational language actually used within an industry,' the report says. 'The completed forms are then turned over to an 'in house' or commercial data processing service for coding, keypunching, editing, and computing runs.'

Other features of the TRANSIM approach include: TRANSIM is general purpose. The standardized computer program included in TRANSIM can be used, without modification, from problem to problem. There is no fixed, built-in computer program logic relating only to individual, specific transportation problems. TRANSIM is inexpensive and fast to use. Because new programming is not required and because the simplified input data format is designed for maximum use of readily available data sources, problem turnaround (from formulation to solution) can be accomplished in a small fraction of the time and cost required with other approaches.

Problems for simulation can be set up by individuals who are not necessarily familiar with computer programming or computer technology. Managers, supervisors, operators and engineers can become the analysts. They can structure the simulation model, specify the output formats and, in general, 'turn the knobs' of the simulator.

Eliminated is the need for schooling mathematics and programmers in highly specialized real system practices and operating characteristics in order for them to design a special-purposed computer program that can adequately represent the real-life system. This overcomes a basic drawback to widespread use of computer simulation -- the communications gap between the analyst and management.

RESEARCH & DEVELOPMENT REPORTS

1. AERONAUTICS

N66-24904 **Field 1 -**
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Literatuuroverzicht Luchtvaarttechniek
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In English, German, And Dutch Its Vol. 14, No. L-292

Descriptors: *Abstract, *Aerodynamics, Air, *Air traffic control, Aircraft, *Bibliography, Control, Design, Fuel, *Helicopter, Navigation, *Parachute, Stability, Tail, Traffic, Wing.

For abstract, see S 04 13.

1A. AERODYNAMICS

AD-638 833 **Field 1A**
Not available from CFSTI.
Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
VISCOSITY OF AIR.
Revised ed.
by Anthony W. Fiore. 28 Feb 66, 7p ARL-66-0124
Proj. AF7064
Revision of manuscript submitted 18 Oct 65.
Availability: Published in Journal of Spacecraft and Rockets v3 n5 p756-8 May 1966.

Descriptors: (*Viscosity, *Air), Aerodynamics, Flight, Mathematical analysis, Equations of motion.

In aerodynamic research there are certain similarity parameters that must be reproduced in a wind tunnel in order to insure that proper flight conditions are simulated. Some of these parameters are the Reynolds number, the Prandtl number, and the Knudsen number. Each of these is a function of viscosity. For this reason, the proper form of the equation for the coefficient of viscosity is important. In transonic and supersonic wind tunnels, the practice has been to use either the Sutherland or the Grieser-Goldthwaite equation for the viscosity. (Author)

AD-639 235 **Field 1A, 1C**
CFSTI Prices: HC$4.00 MF$1.00
General Electric Co., Cincinnati, Ohio. Advanced Engine and Technology Dept.
ESTIMATED DYNAMIC STABILITY CHARACTERISTICS.
Sep 64, 130p Rept. no. 151
Contract DA-44-177-TC-715
Rept. on XV-5A Lift Fan Flight Research Aircraft Program.

Descriptors: (*Vertical take-off planes, Stability), (*Research planes, Vertical take-off planes), Dynamics, Lift, Ducted fans, Aerodynamic characteristics.

Identifiers: V-5 aircraft.

The report presents the dynamic stability characteristics of the U.S. Army XV-5A lift fan research aircraft based on theoretical and empirical estimates of dynamic stability derivatives and static aerodynamic characteristics derived from scale model wind tunnel tests. Except for a presentation of the lift fan natural damping contributions to flight in the lift fan mode, the report is restricted to analysis of conventional flight characteristics. Investigation shows that the dynamic stability characteristics of the aircraft are satisfactory for the research objectives within the examined flight envelope. (Author)

AD-639 236 **Field 1A, 1C**
CFSTI Prices: HC$6.00 MF$1.25
General Electric Co., Cincinnati, Ohio. Advanced Engine and Technology Dept.
ESTIMATED STATIC STABILITY AND CONTROL CHARACTERISTICS.
Mar 64, 230p Rept. no. 146
Contract DA-44-177-TC-715
Rept. on XV-5A Lift Fan Flight Research Aircraft Program.

Descriptors: (*Vertical take-off planes, Aerodynamic characteristics), (*Research planes, Vertical take-off planes), Flight control systems, Statics, Stability, Model tests, Wind tunnel models, Ducted fans, Hovering, Lift.

Identifiers: V-5 aircraft.

The XV-5A is a two-engine, two-place V/STOL research aircraft with a design gross weight of 9200 pounds and an aspect ratio 3.42 wing of 260 square feet. In conventional flight mode the aircraft has a power-off flaps-down stall speed of 89 knots and a design maximum speed of 450 knots. In fan flight mode the aircraft can sustain flight at any speed from hovering to speeds in excess of conventional stall speed. The report represents an estimate the XV-5A aerodynamic characteristics, based on theoretical and empirical considerations, including the results of 420 hours of wind tunnel tests of 1/8 and 1/6 scale models. In the fan flight mode, the aircraft is estimated to be statically unstable in pitch with the most aft cg at low speeds below approximately 70 knots but with an increasing stability with speed to the conversion speed where the stability level corresponds to that for conventional flight. The aircraft possesses positive lateral and directional static stability with sideslip at all forward speeds in fan-powered flight and the effectiveness of the conventional flight control system is shown to be unaffected by fan operation. The exit louver control system is capable of providing the required propulsive force for acceleration of the airplane from a minimum of 10 knots rearward to conversion speed and provides a thrust attenuation of up to 22% for hovering lift control. (Author)

N66-24284 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
Chalmers Univ. Of Technology, Goteborg (Sweden).
ISOSTATIC SUPPORT - NOTES ON EQUILIBRIUM, DISPLACEMENT, AND ISOSTATIC SUPPORT OF RIGID BODIES IN PLANE AND SPACE.
by B. A. Akesson. 1965, 36p
Its Trans. No. 302

Descriptors: Algebra, Body, Displacement, Equilibrium, Isostasy, *Isostatic pressure, Load, Mechanics, Plane, Pressure, *Rigid body, Rigidity, Space, *Space mechanics, Stability, Static, *Static loading, *Structural stability, Structure, Support.

For abstract, see S 04 13.

N66-24325 **Field 1A**
CFSTI Prices HC$3.00 MF$0.50
Aeronautical Research Inst. Of Sweden, Stockholm.
DESCRIPTIVE REPORT OF ACTIVITIES OF THE FLYGTEKNISKA FORSOKSANSTALTEN, FFA.
1965, 56p

Descriptors: *Aerodynamics, Aeronautics, Aircraft, *Aircraft structure, Dynamic, Dynamics, Equipment, Experiment, Facility, Fatigue, Hypersonic, Loading, Research, *Research facility, Static, Structural, *Structural dynamics, Structure, Subsonic, Testing, Theoretical.

For abstract, see S 04 13.

N66-24634 **Field 1A**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration, Washington, D. C.
HYPERLIFT AND BALANCING OF SLENDER WINGS.
Hypersustentation Et Equilibrage Des Ailes Elancees
by E. Erlich, and P. Poisson-quinton. Aug 65, 76p NASA-TT-F-9523
Transl. Into English Of A French Paper Presented At The Onera Colloq. Of Appl. Aerodyn., Paris, 12-13 Nov. 1964

Descriptors: Aerodynamic, Aircraft, *Balance, Canard, Delta, *Delta wing, *Lift, Slender, *Slender wing, Supersonic, *Supersonic transport, Sweepback, Transport, Variable, Wing.

For abstract, see S 04 13.

N66-24826 **Field 1A**
CFSTI Prices HC$3.00 MF$0.75
Aerodynamische Versuchsanstalt, Gottingen (West Germany).
AERODYNAMIC INVESTIGATIONS OF CONES IN THE HYPERSONIC MACH NUMBER RANGE.
Aerodynamische Untersuchungen An Kegeln Im Hypersonischen Machzahlbereich
by TH. Hottner. 15 Dec 66, 83p REPT.-64-A-48
In German

Descriptors: Aerodynamic, *Aerodynamic characteristics, Body, Characteristics, Circle, *Circular cone, Cone, Drag, Flow, Force, Hypersonic, *Hypersonic wind tunnel, Lift, Pressure, Speed, Tunnel, Wind.

For abstract, see S 04 13.

N66-24832 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautical Lab., Bangalore (India).
INVESTIGATIONS ON VORTEX FLOWS.
by Y. V. Acharya, P. A. Irani, and K. Krishnamurthy. Sep 65, 58p TN-AE-28-65

Descriptors: Axial, Boundary, *Boundary layer, Design, Edge, Flow, *Flow pattern, Helical, Layer, Leading, Pattern, Reverse, Tunnel, Vane, Vortex, *Vortex flow, Wall.

For abstract, see S 04 13.

N66-24836 **Field 1A**
CFSTI Prices HC$3.00 MF$0.75
Aerodynamische Versuchsanstalt, Gottingen (West Germany).
TURBULENT BOUNDARY LAYERS WITH BLOWOFF FROM COLD AND WARM AIR THROUGH A PERFORATED OR SLOTTED WALL.
Turbulente Grenzschichten Mit Ausblasen Von Kalter Und Warmer Luft Durch Eine Gelochte Oder Geschlitzte Wand
by W. Wuest. 13 Oct 64, 68p REPT.-64-A-37
In German

Descriptors: *Aerodynamics, Air, Boundary, *Boundary layer flow, Cold, Flow, Heat, Layer, Mass, *Mass transfer, *Perforated plate, Perforation, Plate, Suction, Transfer, Turbulence, *Turbulent heat transfer, Wall, Warm.

For abstract, see S 04 13.

N66-24841 **Field 1A, 20M**
CFSTI Prices HC$2.00 MF$0.50
Aerodynamische Versuchsanstalt, Gottingen (West Germany).
TURBULENT BOUNDARY LAYERS WITH PRESSURE GRADIENTS AND HEAT TRANSFER.
by J. C. Rotta. 7 Jul 64, 40p REPT.-64-A-26
Presented At 21st Agard Fluid Dyn. Panel On De-

velop. In Boundary Layer Res., Lisbon, 14-15 Sep. 1964

Descriptors: Boundary, Compressibility, *Compressible flow, Distribution, Flow, Gradient, *Heat transfer, Incompressibility, *Incompressible flow, Layer, Pressure, *Pressure gradient, Profile, Temperature, Turbulent, *Turbulent boundary layer, Velocity.

For abstract, see S 04 13.

N66-24894 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
Institut Franco-allemand De Recherches, St. Louis (France).
METHOD OF DETERMINING THE RESISTANCE COEFFICIENT OF A SPHERE RELEASED AT GREAT VELOCITY IN A REENTRY SIMULATOR.
Methode De Determination Du Coefficient De Trainee D'une Sphere Lancee A Grande Vitesse Dans Le Simulateur De Rentree
by J. Luneau. 13 Nov 64, 44p ISL-T-48/64
In French

Descriptors: Acceleration, Approximation, *Approximation method, Body, Calculation, Coefficient, Drag, *Drag coefficient, Method, Projectile, Reentry, *Reentry trajectory, *Simulation, Simulator, *Sphere, Trajectory, Velocity.

For abstract, see S 04 13.

N66-24925 **Field 1A**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
SUPERSONIC FLOW AROUND ELLIPSOIDS.
Obtekaniye Ellipsoidov Sverkhzvukovym Potokom
by A. P. Shvets. May 66, 12p NASA-TT-F-10179
Transl. Into English From Izv. Akad. Nauk Sssr, Otd. Tekhn. Nauk- Mekhan. I Mashinostr. (Moscow), No. 4, 1964, P 29-32

Descriptors: *Aerodynamics, Compression, Detachment, Distribution, Drag, *Ellipsoid, Flow, Force, Pressure, Shock, *Shock wave, Spectrum, Supersonic, *Supersonic flow, Tunnel, U.s.s.r., Wave, Wind, *Wind tunnel.

For abstract, see S 04 13.

N66-24940 **Field 1A**
CFSTI Prices HC$4.00 MF$0.75
Toronto Univ. (Ontario).
INTEGRAL METHODS IN COMPRESSIBLE LAMINAR BOUNDARY LAYERS AND THEIR APPLICATION TO HYPERSONIC PRESSURE INTERACTIONS.
by Y.-Y. Chan. Jan 65, 108p NASA-CR-74707, UTIAS-104
Grant NSG-633

Descriptors: Analysis, Axial, Boundary, Compressibility, Dimensional, Flow, Gradient, *Heat transfer, Hypersonic, *Hypersonic flow, Integral, Interaction, Interference, Laminar, *Laminar boundary layer, Layer, Mathematics, Method, Pressure, *Pressure gradient, Property, Transformation, Two.

For abstract, see S 04 13.

N66-24999 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
Rice Univ., Houston, Tex.
POWER-LAW BODIES OF MAXIMUM LIFT-TO-DRAG RATIO IN HYPERSONIC FLOW.
by HO.-YIHuang, and A. Miele. 1966, 37p NASA-CR-74732, AAR-20
Contract NGR-44-006-034

Descriptors: Body, Coefficient, Configuration, Drag, Flat, Friction, *Friction coefficient, Hypersonic, Law, Lift, *Lift-drag ratio, Newton, *Newton pressure law, Pressure, Ratio, Skin, *Skin friction, Slender, *Slender body, Top.

For abstract, see S 04 13.

N66-25022 **Field 1A**
CFSTI Prices HC$5.50 MF$2.50
National Aeronautics And Space Administration, Washington, D. C.
THREE-DIMENSIONAL FLOW OF IDEAL GAS PAST SMOOTH BODIES.
by K. I. Babenko, A. N. Lyubimov, V. V. Rusanov, and G. P. Voskresenskiy. Apr 66, 522p NASA-TT-F-380
Transl. Into English Of The Book "Prostrantvennoye Obtekaniye Gladkikh Tel Ideal 'anym Gazom" Moscow, Izd. Nauka, 1964

Descriptors: *Axisymmetric flow, Axisymmetry, Body, *Body of revolution, Calculation, Difference, Dimensional, Equation, Field, Finite, Flow, *Flow field, Gas, Ideal, *Ideal gas, Method, Nonaxisymmetric, Nonlinear, Revolution, Smoothness, Three, *Three-dimensional flow.

For abstract, see S 04 13.

N66-25159 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
AN INVESTIGATION AT MACH NUMBERS FROM 0.40 TO 1.00 OF A MODEL WITH A WING HAVING INBOARD SECTIONS CAMBERED FOR MACH 1.2.
by R. J. Re, and G. Stumbris. May 66, 41p NASA-TN-D-3419

Descriptors: Aerodynamic, *Aerodynamic characteristics, Aircraft, *Aircraft model, Body, Chamber, Characteristics, Longitudinal, *Longitudinal stability, Model, Speed, Stability, Subsonic, *Subsonic speed, Tail, Test, Transport, Tunnel, Wind, Wing, *Wing body.

For abstract, see S 04 13.

N66-25189 **Field 1A**
CFSTI Prices HC$3.00 MF$0.75
Deutsche Versuchsanstalt Fur Luft- Und Raumfahrt, Stuttgart (West Germany).
CALCULATION OF THE BENDING OSCILLATIONS OF A ROTOR BLADE WITH HINGE-CONCENTRATED MASSES.
Berechnung Der Biegeschwingungen Eines Rotorblattes Mit Massengelenken
by H. Oette. Dec 65, 64p DLR-FB-65-54, DFL-75
In German, English And French Summary

Descriptors: Aerodynamic, Bending, *Bending vibration, Blade, Calculation, Concentration, Differential, Equation, Equilibrium, Force, Hinge, *Hinged rotor blade, Loading, Mass, Motion, *Oscillation, Rotor, Single, Vibration.

For abstract, see S 04 13.

N66-25225 **Field 1A**
CFSTI Prices HC$3.00 MF$0.50
Aeronautical Research Council (Gt. Brit.)
SLENDER-BODY THEORY CALCULATIONS OF THE EFFECT ON LIFT AND MOMENT OF MOUNTING THE WING OFF THE FUSELAGE CENTER-LINE.
by R. S. Bartlett. 1965, 56p ARC-CP-830, ARC-25-965

Descriptors: Aerodynamic, Asymmetry, Body, Calculation, Combination, Configuration, Fuselage, Leading, *Lift, Moment, Mounting, Pitch, *Pitching moment, Slender, *Slender body, Trailing, Wing, *Wing-fuselage combination.

For abstract, see S 04 13.

N66-25249 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
A DIRECT METHOD FOR CALCULATION OF THE FLOW ABOUT AN AXISYMMETRIC BLUNT BODY AT ANGLE OF ATTACK.
by I. O. Bohachevsky, and R. E. Mates. May 66, 42p NASA-CR-483
Contract NAS5-3976

Descriptors: Afterbody, Angle, *Angle of attack, Attack, *Axisymmetric body, Axisymmetry, Blunt, *Blunt body, Body, Calculation, Cone, Flight, Flow, Inviscid, *Inviscid flow, Problem, Reentry, Solution, Supersonic, *Supersonic flow.

For abstract, see S 04 13.

N66-25550 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
CHARTS OF ADDITIVE DRAG COEFFICIENT AND MASS-FLOW RATIO FOR INLETS UTILIZING RIGHT CIRCULAR CONES AT ZERO ANGLE OF ATTACK.
by V. R. Mascitti. May 66, 48p NASA-TN-D-3434

Descriptors: Additive, Angle of attack, Calculation, *Chart, Coefficient, Cone, *Conical inlet, Drag, *Drag coefficient, Flow, Hypersonic, Inlet, Mach number, Mass, *Mass flow, Sonic, Supersonic.

For abstract, see S 04 14.

N66-26231 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
Lockheed Missiles And Space Co., Sunnyvale, Calif.
FORCES INDUCED ON BODIES IN FREE WAKES AND THREE-DIMENSIONAL CAVITIES.
by J. P. Reding. Dec 65, 36p NASA-CR-74998, LMSC-667990
Contract NAS8-5338

Descriptors: Aerodynamic, *Aerodynamic force, Apollo spacecraft, Body, *Cavity, Dimensional, Flow, Force, Free, *Free flow, Hypersonic, *Hypersonic wake, Load, Model, Saturn launch vehicle, Test, Three, Tunnel, Wake, Wind, *Wind tunnel model.

For abstract, see S 04 14.

N66-26705 **Field 1A**
CFSTI Prices HC$1.00 MF$0.50
Avco Corp., Wilmington, Mass.
THEORETICAL PREDICTION OF THE EQUILIBRIUM REAL GAS INVISCID FLOW FIELDS ABOUT BLUNT BODIES FINAL REPORT.
Dec 63, 24p NASA-CR-75053
Contract NAS9-858

Descriptors: Blunt, *Blunt body, Body, Detachment, Distance, Equation, Equilibrium, Flow, *Flow field, Gas, Inviscid, *Inviscid flow, Location, Point, Problem, Real, *Real gas, Region, Shock, Stagnation, Subsonic, Supersonic.

For abstract, see S 04 14.

N66-26738 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
National Aerospace Lab., Tokyo (Japan).
THE SHAPE OF MECHANICAL HYSTERESIS LOOP, ITS DEFORMATION DUE TO STRESS REPETITION AND RESULTING INCREASE IN FLOW STRESS.

by F. Nagai, F. Nakanishi, and Y. Sato. 1965, 33p NAL-TR-90
In Japanese, English Summary

Descriptors: Elasticity, Flow, Geometry, *Hysteresis, Load, *Loading, Loop, Material, Mechanical, *Mechanical property, Plasticity, Property, Shear, Stress, *Stress and load, Tension, Testing, Torsion.

For abstract, see S 04 14.

N66-26854 **Field 1A**
CFSTI Prices HC$3.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
BINARY DIFFUSION IN AN EXPONENTIAL MEDIUM.
by M. Liwshitz. May 66, 52p NASA-TM-X-55490, X-641-66-230

Descriptors: Ambient, Atmospheric, *Atmospheric diffusion, Binary, Component, Density, Diffusion, Dimensionless, Diurnal, Equation, Escape, Exponent, Gaseous, *Gaseous diffusion, Helium, Hydrogen, Mathematical, Medium, Minor, Model, Particle, Transport, Variance, Vertical.

For abstract, see S 04 14.

N66-26856 **Field 1A**
CFSTI Prices HC$4.00 MF$1.00
Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
COMPUTER PROGRAM FOR THE NUMERICAL SOLUTION OF NONEQUILIBRIUM EXPANSIONS OF REACTING GAS MIXTURES.
by J. A. Lordi, R. E. Mates, and J. R. Moselle. May 66, 155p NASA-CR-472
Contract NASR-109

Descriptors: Area, Computer, *Computer program, Distribution, Equilibrium, Flow, Gas, *Gas mixture, Ion, Mixture, *Nonequilibrium, Nozzle, Numerical, Pressure, Program, Reaction, Solution, Thermodynamic, Variation, Velocity.

For abstract, see S 04 14.

N66-26873 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
FREE-FLIGHT AND FREE-OSCILLATION TECHNIQUES FOR WIND-TUNNEL DYNAMIC-STABILITY TESTING.
by R. H. Prislin. 1 Mar 6-, 40p NASA-CR-75275, JPL-TR-32-878
Contract NAS7-100

Descriptors: Aerodynamic, Characteristics, Drag, Dynamic, *Dynamic stability, Flight, Free, *Free flight, Lift, Method, Motion, *Oscillation, Planar, Stability, Test, *Test method, Tunnel, Wind, *Wind tunnel stability test.

For abstract, see S 04 14.

N66-34102 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
LOW-SPEED ROLL EFFECTIVENESS OF A DIFFERENTIALLY DEFLECTED HORIZONTAL-TAIL SURFACE ON A 42 DEG SWEPT-WING MODEL.
by P. C. Boisseau. 19 Jun 56, 30p NACA-RM-L56E03

Descriptors: *Aircraft, Configuration, Deflection, Differential, Effectiveness, Flight, Free, *Free flight, Horizontal, *Horizontal tail, Model, Roll, Sweep, *Swept wing, Tail, Testing, Tunnel, Wind, *Wind tunnel model, Wing.

For abstract, see S 04 20.

N66-34633 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
Rice Univ., Houston, Tex.
THREE-DIMENSIONAL, LIFTING WINGS OF MINIMUM DRAG IN HYPERSONIC FLOW.
by D. G. Hull, and A. Miele. 1966, 29p NASA-CR-77291, AAR-26
Contract NGR-44-006-045

Descriptors: Calculus, Chord, Dimension, Distribution, Drag, Flow, Hypersonic, *Hypersonic flow, Lifting, Minimum, *Minimum drag, Slender, *Slender wing, Span, Three, Variation, Wing.

For abstract, see S 04 20.

N66-34677 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
Rice Univ., Houston, Tex.
LIFTING BODIES OF MINIMUM DRAG IN HYPERSONIC FLOW.
by A. H. Lusty Jr. 1966, 42p NASA-CR-77177, AAR-21
Contract NGR-44-006-034

Descriptors: Body, Calculus, Coefficient, Drag, *Drag reduction, Flow, Friction, Hypersonic, *Hypersonic flow, Length, Lifting, *Lifting body, Newton, Pressure, Reduction, Skin, Thickness, Variation, *Variational calculus, Volume, Wetness.

For abstract, see S 04 20.

N66-34797 **Field 1A**
CFSTI Prices HC$1.00 MF$0.50
Rice Univ., Houston, Tex.
THREE-DIMENSIONAL WINGS OF MAXIMUM LIFT-TO- DRAG RATIO IN HYPERSONIC FLOW AERO- ASTRONAUTICS REPORT NO. 27.
by D. G. Hull, and A. Miele. 1966, 25p NASA-CR-77176
Contract NGR-44-006-045

Descriptors: Base, Calculus, Critical, Drag, Edge, Flow, Free, Friction, Hypersonic, *Hypersonic flow, Lift, *Lift-drag ratio, Maximum, Optimization, Optimum, Planform, Pressure, Ratio, Skin, Slender, Trailing, Variation, *Variational calculus, Volume, Wing, *Wing planform.

For abstract, see S 04 20.

N66-34994 **Field 1A**
CFSTI Prices HC$3.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
SUBSONIC AND SUPERSONIC AERODYNAMIC CHARACTERISTICS OF AN AIRPLANE CONFIGURATION UTILIZING DOUBLE-PIVOT VARIABLE-SWEEP WINGS.
by W. J. Alford Jr, G. V. Foster, and E. C. Polhamus. Dec 62, 57p NASA-TM-X-743

Descriptors: Aerodynamic, *Aerodynamic characteristics, Aircraft, *Aircraft configuration, Characteristics, Configuration, Double, Model, Pivot, *Pivoted wing, Stability, Subsonic, Supersonic, Sweep, Tunnel, Variable, *Variable sweep, Wind, Wing.

For abstract, see S 04 20.

N66-34996 **Field 1A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
SUBSONIC AERODYNAMIC CHARACTERISTICS OF AN AIRPLANE CONFIGURATION UTILIZING A VARIABLE- SWEEP WING HAVING A FREE-FLOATING APEX.
by A. D. Hammond, and E. C. Polhamus. Jul 65, 36p NASA-TM-X-1126

Descriptors: Aircraft, Angle, Apex, Attack, *Attack aircraft, Floating, Free, Incidence, Longitudinal, *Longitudinal stability, Pitch, Speed, Stability, Subsonic, *Subsonic wind tunnel, Supersonic, Sweep, Tunnel, Variable, *Variable sweep, Wind, *Wing.

For abstract, see S 04 20.

N66-35048 **Field 1A**
CFSTI Prices HC$4.00 MF$1.00
Wichita Univ., Kans.
AN EXPERIMENTAL INVESTIGATION OF THE FLOW FIELDS ABOUT DELTA AND DOUBLE-DELTA WINGS AT LOW SPEEDS.
by M. C. Mc mahon, and W. H. Wentz Jr. Aug 66, 145p NASA-CR-521
Contract NGR-17-003-003

Descriptors: Delta, *Delta wing, Distribution, Double, Field, Flow, *Flow field, Force, Low speed, *Low speed wind tunnel, Model, Moment, Oil, Pattern, Pressure, Strake, Streak, Surface, Sweepback, Tuft, Tunnel, Velocity, Vortex, Wind, Wing.

For abstract, see S 04 20.

N66-35139 **Field 1A, 14B**
CFSTI Prices HC$2.00 MF$0.50
Deutsche Forschungsanstalt Fur Luft- Und Raumfahrt, Brunswick (West Germany).
THE TIME-LAG OF PRESSURE READINGS THROUGH HOSE PIPES, PART I.
Druckanzeigeverzoegerung
en Durch Schlauchleitungen, Teil I
by N. Schmidt. 20 Jan 66, 44p DLR-FB-66-27
In German, English Summary

Descriptors: Aerodynamics, Calculation, Delay, Flow, Gas, *Gas flow, Oscillation, Pressure, *Pressure tube, Propagation, Time, *Time delay, Tube, Tunnel, Volume, Wind, *Wind tunnel.

For abstract, see S 04 20.

PB-170 859 **Field 1A, 19B**
CFSTI Prices: HC$3.60 MF$0.50
Weapons Research Establishment, Salisbury (Australia).
FREE FLIGHT MEASUREMENTS OF AERODYNAMIC FORCES AND MOMENTS ON TWO STREAMLINED BOMBS WITH CRUCIFORM FINS.
Technical note.
by D. P. Brown. Mar 66, 34p HSA-116

Descriptors: (*Aerodynamic characteristics, Bombs), (*Bombs, Force (Mechanics)), Bomb fins, Flight testing.

The aerodynamic forces and moments on two streamlined bombs with fixed cruciform fins have been measured in full scale free flight trials over the Mach number range 0.7 to 1.15. The bombs were instrumented to measure angle of attack and lateral accelerations. Large pitching oscillations were obtained by firing small lateral pulse rockets at predetermined times during an otherwise free fall. The dependence of the observed aerodynamic forces and moments upon incidence, roll attitude and pitching velocity was determined by a curve-fitting method. Agreement between the free flight and wind tunnel measurements of normal forces and moments is good over the experimental Mach number range with the exception of low incidence restoring moments for one of the bombs near sonic speed. (Author)

PB-170 866 **Field 1A, 7D, 20D**
CFSTI Prices: HC$3.00 MF$0.75
Massachusetts Inst. of Tech., Cambridge. Fluid Mechanics Lab.
A NEW FORMULATION OF THE MULTICOMPONENT TRANSPORT EQUATIONS FOR USE IN LAMINAR BOUNDARY LAYER PROBLEMS.
by Marvin E. Goldstein. May 66, 59p Pub-66-3
Grant NGR-22-009-052

Descriptors: (*Laminar boundary layer, Numerical analysis), (*Integral equations, Fluid mechanics), Transport properties, Chemical reactions, Stagnation point, Kinetic theory.

A new formulation of the multicomponent boundary layer problem which is convenient for numerical calculations is developed. This is accomplished by a modification of the usual Chapman-Enskog procedure which is intermediate between that procedure and Grad's thirteen-moment method. The relations which are developed do not involve transport coefficients but rather expressions for the gradients of the physical variables as linear combinations of the fluxes. The complete set of boundary layer equations turn out to be a set of first-order differential equations and a set of algebraic equations which are linear in the fluxes. These expressions contain the averaged cross sections instead of transport coefficients. (Author)

AD-638 965 See Field 20D

AD-638 984 See Field 21E

AD-638 985 See Field 21E

AD-638 986 See Field 21E

N66-24560 See Field 1C

N66-24838 See Field 20D

1B. AERONAUTICS

AD-639 031 Field 1B, 5J
Not available from CFSTI.
Illinois Univ., Urbana.
THE EFFECTS OF ELIMINATING BINOCULAR AND PERIPHERAL MONOCULAR VISUAL CUES UPON AIRPLANE PILOT PERFORMANCE IN LANDING.
by Stanley N. Roscoe. 8 Apr 48, 14p
Contract N6ori-071 (16)
SPECDEVCEN-71-16-5A
Availability: Published in Journal of Applied Psychology v32 n6 P649-62 Dec 1948.

Descriptors: (*Landings, Visual signals), (*Pilots, Performance (Human)), Space perception, Visibility, Periscopes, Eyeglasses, Instrument flight, Approach.

Six instrument pilots were tested for accuracy of landing under these conditions of visibility in a Cessna T-50 aircraft: Condition A. Outside vision restricted to an image cast on a ground glass screen by a projection periscope. The image confined the range of outside visibility to a visual angle of approximately 10 degrees, both horizontally and vertically, and binocular cues of depth and movement were eliminated. Condition B. Similar restriction of the outside visual field achieved by use of vision reducing goggles and a vision directing screen. Binocular cues were present. Condition C. Unrestricted outside visibility as in normal contact flight. This situation served as control. Every pilot made five landings under each condition, ninety landings being made in all. Conditions were rotated among pilots to balance practice effects. Safe approaches and landings were made by all pilots in all conditions. Landings were most accurately made in Condition C, control, where the average error was 85.1 feet from the landing 'spot' (sign of error disregarded). The average error for landings in Condition B (vision reducing goggles) was 142.4 feet. Least accurate landings were made in Condition A (periscope) where the average error was 251.8 feet. These differences were found to be significant in each case, but the difference between periscope and goggles may be exaggerated as a result of certain unforeseen procedural difficulties which were uncontrolled. (Author)

AD-639 032 Field 1B
CFSTI Prices: HC$2.00 MF$0.50
Illinois Univ., Urbana.
FLIGHT BY PERISCOPE.
by Stanley N. Roscoe, and Scott G. Hasler. 1952, 50p
Contract N6ori-071 (16)
SPECDEVCEN-71-16-9

Descriptors: (*Instrument flight, *Periscopes), Take-off, Landings, Attitude indicators, Flight paths.

It was demonstrated that pilots can make takeoffs and landings with a high level of proficiency using a periscope to show flight attitudes and the flight path. Image magnification of the display had little effect on the safety with which pilots made takeoffs. Magnification decreased the accuracy and possibly the safety with which they made periscope landings. Practice in flying by periscope resulted in a rapid improvement in accuracy and an increase in confidence. Flight by periscope is practical and safe at least in slow speed planes. It indicates that a radar or television method for presenting ground reference information offers a practical aid to instrument flight. (Author)

N66-34100 Field 1B
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
MINIMUM DRAG OF FOUR VERSIONS OF A SWEPT-WING FIGHTER AIRPLANE OBTAINED FROM FLIGHT TESTS OF ROCKET-BOOSTED MODELS AT MACH NUMBERS FROM 0.81 TO 1.71.
by E. C. Hastings Jr. 7 Sep 56, 32p NACA-RM-L56E25A

Descriptors: Aircraft, *Aircraft configuration, Area, Coefficient, Configuration, Cross section, Drag, *Drag coefficient, External, Fighter, *Fighter aircraft, Forebody, Mach number, Reduction, Sweep, *Swept wing, Test, Wing.

For abstract, see S 04 20.

PB-170 387 Field 1B, 1C
CFSTI Prices: HC$5.00 MF$1.00
All American Engineering Co., Wilmington, Del.
DESIGN, DEVELOPMENT, AND EVALUATION OF A CRASHRESISTANT FUEL SYSTEM INSTALLATION.
Technical rept.
by W. Buckson, W. Schlegel, and I. R. Smith. Dec 65, 196p
Contract FA-WA-4580
FAA-ADS-27

Descriptors: (*Aircraft equipment, Fuel systems), (*Fuel systems, Fire safety), (*Aviation accidents, Fuel systems), Aircraft fires, Engine fuel systems components, Disconect fittings, Valves, Packing materials, Glass textiles, Deceleration.

Identifiers: Crash-resistant fuel systems.

A crash-resistant fuel system, utilizing high-strength bladder fuel cells, breakaway fittings, crash-load-actuated shut-off valves, and fiber glass protective liners, was designed and installed in the center section of a DC-7 aircraft wing. The wing was mounted on a wheeled dolly and the No. 2 and No. 3 main fuel tanks were filled with water. The No. 2 tank was standard DC-7 configuration; the No. 3 tank was equipped with CRF components. A jet-propelled car was used to accelerate the wing and dolly to predetermined velocities prior to engaging a decelerator. The decelerator, especially designed for this project, imposed controlled decelerations on the wing ranging from 2 g's to 21 g's (28-g fuel equivalent). There were no failures in either standard or crash-resistant fuel (CRF) system fuel cells and no inadvertent valve closures in the CRF system during the tests. Hydraulic loads were nominal and were not additive from one cell to another through interconnections. A final destructive test was conducted wherein the wing, at a velocity of 77 knots, engaged two stationary vertical poles, positioned to shear the wing panels at the outboard nacelles. It was demonstrated that, with a more positive means of triggering shut-off valves, the CRF system has a potential for greater chances of fuel containment, with consequent less fire hazard, in case of survivable crashes. The CRF system, as installed in a DC-7, imposes a penalty of 6.97% fuel volume loss for a range loss of 7.6%, although it results in a weight decrease of about 1200 pounds. (Author)

PB-170 691 Field 1B
CFSTI Prices: HC$3.00 MF$0.75
Planning Research Corp., Los Angeles, Calif.
OPERATING COST ESTIMATES FOR LONG-HAUL SUB-SONIC JET AIRCRAFT.
by Ann C. Harvey, and Harold D. Orenstein. 11 Feb 66, 62p PRC-R-804A
Contract SD-274

Descriptors: (*Jet planes, Costs), (*Costs, Mathematical prediction), Operation, Equations, Civil aviation, Transport planes.

The study contains a series of estimating equations for determining the operating costs for large four-engine jet aircraft. Designed for jet transport aircraft these equations apply to the present day high speed, sub-sonic variety such as the Douglas DC-8 and the Boeing 707. Because these aircraft were designed for long flight segments, the equations characteristically yield optimal results under these service conditions. The equations are developed for a typical flight distance of 1455 miles domestically and 1980 miles internationally. The equations are generally applicable to other flight distances but in certain instances tend to be less reliable for short segments.

PB-170 789 Field 1B, 5C
CFSTI Prices: HC$2.00 MF$0.50
Federal Aviation Agency, Washington, D. C. Office Policy Development.
DIRECT OPERATING COSTS AND OTHER PERFORMANCE CHARACTERISTICS OF TRANSPORT AIRCRAFT IN AIRLINE SERVICE.
Rept. for 1964.
Sep 65, 34p

Descriptors: (*Transport planes, Commerical planes), (*Commerical planes, Costs), Jet transport planes, Helicopters, Economics, Statistical data.

The report for calendar year 1964 is the fifth in a series prepared annually to meet a requirement within the Federal Aviation Agency for a brief reference document containing measures of aircraft performance and direct operating costs achieved in recent airline service. It is designed specifically to show, for the various types of airline aircraft, data on utilization, seating capacities, speeds, fuel consumption, and average stage lengths as well as on direct operating costs and the elements thereof.

PB-170 976 Field 1B, 4B
CFSTI Prices: HC$3.60 MF$0.50
Travelers Research Center, Inc., Hartford, Conn.
AVIATION TERMINAL WEATHER PREDICTION.
Quarterly progress rept., 17 Feb-31 May 61, 31 May 61, 39p
Contract Cwb-10041

Descriptors: (*Weather forecasting, Terminal flight facilities), (*Terminal flight facilities, Weather forecasting), (*All-weather aviation, Weather forecasting), Aeronautics.

The objectives of the project are to carry out physical and statistical studies of aviation terminal weather variations and to develop terminal weather prediction techniques applicable to the range 0 - 2 hours. The program includes the following tasks: (1) The collection and editing of airport weather data, to be carried out for stations and per-

iods of record as required for the analysis and study of terminal weather variations and the development of terminal prediction techniques. (2) the prediction techniques are to be applicable to periods of a few minutes up to three hours for Boston, Idlewild, Washington, Oklahoma City, an Atlantic City. (Author)

PB-173 065 **Field 1B**
CFSTI Prices: HC$3.00 MF$0.75
Flight Safety Foundation, Inc., New York.
ECONOMICS OF SAFETY IN CIVIL AVIATION (PLANNING STUDY).
Technical rept.
by J. Lederer, C. O. Miller, and C. F. Schmidt.
Dec 63, 86p
Contract FA-WA-4457
FAA-ADS-7

Descriptors: (*Civil aviation, Aviation safety), (*Aviation safety, Civil aviation), Economics, Cost effectiveness, Aeronautics, Management planning.

Information is developed to establish a program for the prudent management of resources allocated to safety. The study lists and defines the variables that constitute: (1) the monetary investment in air safety, (2) the economic losses arising from accidents, (3) the economic returns from the investment in safety. A plan is proposed by which the variables can be assessed in terms of dollars and then used to evaluate the cost effectiveness of safety measures. The object is to optimize the expenditure of funds to improve safety. The emphasis is on air transportation. (Author)

AD-639 342 **See Field 5I**

N66-25322 **See Field 14B**

N66-26735 **See Field 4B**

PB-172 926 **See Field 17G**

PB-172 927 **See Field 17G**

1C. AIRCRAFT

AD-638 868 **Field 1C, 5E**
CFSTI Prices: HC$2.00 MF$0.50
Naval Training Device Center, Port Washington, N. Y.
LEGIBILITY OF AIRCRAFT INSTRUMENT DIALS: OXYGEN DURATION METER.
Technical rept.
by J. Sanford Davis, Oct 51, 42p SDC-20-L-4 (1)
Proj. SDC-20-L-4

Descriptors: (*Instrument dials, *Human engineering), (*Oxygen equipment, Instrument dials), Instrument panels, Aircraft equipment, Meters, Design.

Identifiers: Legibility.

CONCLUSIONS: An open face instrument is better than a closed face instrument. This applies to not only the oxygen duration meter but also to other instruments. Whole numbers are easier to read than fractions. This is not limited to the oxygen duration meter studies. The large instrument used in this experiment is superior to the small instrument. However, due to the small difference between them a small instrument can be employed when reading speed is not important and other factors indicate an advantage in using a small instrument. An empty oxygen bottle should be represented by the figure zero rather than a line. Dial graduations should be in quarter hour units. Readings should indicate increasing values in clockwise direction. (Author)

AD-639 151 **Field 1C, 20D**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
A METHOD FOR MODELING THE PROFILES ON WINGS AND PROPELLERS.
by G. A. Ryazanov, and V. V. Kopeyetskii, 28 Jun 66, 5p FTD-TT-65-1936
Unedited rough draft trans. of Patent (USSR) 168 459, appl. 819243/26-24, 7 Nov 63.

Descriptors: (*Wings, Simulation), (*Propellers (Aerial), Simulation), Circuits, Vortices, Aerodynamic configurations, Magnetohydrodynamics, Patents, USSR.

The object of the invention is a method of modeling the profiles of wings and propellers based on the method of magnetohydrodynamic analogy. To determine the speeds effected, the vortical system of the wing or propeller, determined by a given drop in pressures, is substituted by discrete vortices with constant circulation and modeled by one wire. (Author)

AD-639 189 **Field 1C**
CFSTI Prices: HC$2.00 MF$0.50
Supersonic Transport Development, Federal Aviation Agency, Washington, D. C.
SUPERSONIC TRANSPORT WEIGHT AND BALANCE STANDARD
1 Sep 65, 31p SST-65-13

Descriptors: (*Supersonic planes, Weight), (*Transport planes, Weight), Center of gravity, Standards, Design.

The standard describes the methods that will be used for weight and balance evaluations and discusses the manner in which the weight data is to be reported.

AD-639 191 **Field 1C**
CFSTI Prices: HC$7.00 MF$1.50
Norair Div., Northrop Corp., Hawthorne, Calif.
HIGH LIFT SURFACE; DESIGN PROCEDURES; EXPERIMENTAL VERIFICATION. VOLUME III. WIND TUNNEL TESTS.
by F. W. Peitzman, May 66, 194p NOR-66-206
Contract NOw-65-0380
See also AD-639 289.

Descriptors: (*Wings, Lift), Design, Model tests, Wind tunnels, Programming (Computers), Surfaces.

The volume presents the results of a low speed wind tunnel test of four half-span wing models. The primary objective of the test was to obtain experimental data on wings developed by a high lift surface computer program. Two wings designed by this method, one high and one low lift, were tested. A secondary objective of the test was to determine the feasibility of simulating the high lift wing by flaps on the low lift wing and, conversely, simulating the low lift wing by flaps on the high lift wing. This involved an additional two models for a total of four. (Author)

AD-639 203 **Field 1C, 20D**
CFSTI Prices: HC$3.00 MF$0.75
Hydronautics, Inc., Laurel, Md.
COUPLED RESPONSE OF A FLOAT-SUPPORTED AIRCRAFT IN A SEAWAY.
Technical rept.
by K. K. Wong, May 66, 66p TR-513-2
Contract Nonr-4769 (00)
Proj. NR-212-161
See also AD-639 205.

Descriptors: (*Seaplane floats, Hydrodynamics), Equations of motion, Seaplanes, Ocean waves, Fluid dynamic properties, Force (Mechanics).

A linear method for analyzing the coupled response of a float supported aircraft in a seaway has been derived. It was then applied to two specific aircraft models using the Neumann spectrum to describe the seaway and existing experimental data to estimate the drag and added mass coefficients. Through a systematic variation of the parameters governing the float system it was possible to see their effects on the response characteristics of the aircraft. (Author)

AD-639 205 **Field 1C, 20D**
CFSTI Prices: HC$3.00 MF$0.75
Hydronautics, Inc., Laurel, Md.
EQUATIONS OF MOTION FOR A FLOAT SUPPORTED CRAFT IN A SEAWAY.
Technical rept.
by M. Martin, May 66, 64p TR-513-1
Contract Nonr-4769 (00)
Proj. NR-212-161
See also AD-639 203.

Descriptors: (*Seaplane floats, Equations of motion), Seaplanes, Hydrodynamics, Ocean waves, Fluid dynamic properties, Force (Mechanics).

With the aid of Lagally's theorem for unsteady flow, Taylor's theorem relating added masses to doublets, and strip theory, the forces and moments produced by an arbitrary potential flow field, which is slowly varying in space, on a slender float, free to move in all six degrees of freedom, were determined in terms of the strip-wise added mass distribution. In addition estimates of the contributions of the free surface to the effect of variations in the wetted length are also made. These results, together with estimates of viscous drag, and buoyancy forces, are then incorporated into the equations of motion of a craft supported by an arbitrary number of such floats. By the use of first order wave theory and linearization of the above described relationships the equations of motion are put in a form suitable for computing various statistical quantities useful in describing the behavior of tilt float supported craft in a confused sea. (Author)

AD-639 229 **Field 1C**
CFSTI Prices: HC$6.00 MF$1.25
General Electric Co., Cincinnati, Ohio. Advanced Engine and Technology Dept.
FINAL SYSTEMS ANALYSIS AND FLIGHT SIMULATION REPORT. VOLUME I.
Mar 65, 226p Rept. no. 157-Vol-1
Contract DA-44-177-TC-715
Rept. on XV-5 Lift Fan Flight Research Aircraft Program.

Descriptors: (*Vertical take-off planes, *Flight simulators), (*Research planes, Vertical take-off planes), Analysis, Tests, Lift.

Identifiers: V-5 aircraft.

A comprehensive documentation of the flight simulator study is given. Simulator investigations of high speed conventional flight are described. The construction of the XV-5A flight simulator from initial development of methods for incorporation of the aircraft aero-propulsion characteristics into the analog computer to final checkout of the completed hydraulic and controls simulator is given.

AD-639 230 **Field 1C**
CFSTI Prices: HC$4.00 MF$1.25
General Electric Co., Cincinnati, Ohio. Advanced Engine and Technology Dept.
FINAL SYSTEMS ANALYSIS AND FLIGHT SIMULATION REPORT. VOLUME II.
Mar 65, 121p Rept. no. 157-Vol-2
Contract DA-44-177-TC-715
Rept. on XV-5 Lift Fan Flight Research Aircraft Program. See also AD-639 229.

Descriptors: (*Vertical take-off planes, Simulation), (*Research planes, Vertical take-off planes), Flight simulators, Flight testing, Analysis, Stability, Hovering, Lift.

Identifiers: V-5 aircraft.

Stability augmentation (SA) system gains were optimized by piloted flight simulator evaluation of hovering under gusty wind conditions. While operation of the SA system poses no problems during transition, stability augmentation is unnecessary above 40 knots IAS. For the 2,500 ft. hot day conditions simulated, the rapidity with which a constant altitude transition from hovering could be accomplished was limited by power available and, at the more aft c.g. locations when using a nose fan thrust reversal capability of 30%, by longitudinal trim capability. An automatic horizontal trim feature has been selected for transition which programs the tail to the full 20 degree incidence limit at all louver vector angles of 40 degrees or less. Conversion between conventional and fan flight modes is accomplished by timed sequencing of the wing fan door opening and horizontal tail incidence change as a function of diverter valve motion. Failure studies have shown that uncommanded tail motion could result in a dangerous flight condition. (Author)

AD-639 231 **Field 1C**
CFSTI Prices: HC$6.00 MF$1.25
General Electric Co., Cincinnati, Ohio. Advanced Engine and Technology Dept.
PHASE I FLIGHT TEST RESULTS. VOLUME I.
Mar 66, 191p Rept. no. 166-Vol-1
Contract DA-44-177-TC-715
Rept. on XV-5A Lift Fan Flight Research Aircraft Program.

Descriptors: (*Vertical take-off planes, Flight testing), (*Research planes, Flight testing), Hovering, Lift, Ducted fans, Feasibility studies, Take-off, Propulsion.

Identifiers: V-5 aircraft.

The U.S. Army XV-5A satisfactorily completed an extensive flight test program consisting of investigations of the hovering, transition and conventional flight regimes. A total of 45 flight hours were accomplished during which 53 vertical take-offs, 72 conventional take-offs, 17 fan flight mode take-offs at forward speed, and 74 conversions between fan and conventional flight modes were performed. Original flight test objectives were systematically accomplished in successfully demonstrating the feasibility of the lift fan concept of flight. (Author)

AD-639 232 **Field 1C**
CFSTI Prices: HC$6.00 MF$1.25
General Electric Co., Cincinnati, Ohio. Advanced Engine and Technology Dept.
PHASE I FLIGHT TEST RESULTS. VOLUME II.
Mar 66, 215p Rept. no. 166-Vol-2
Contract DA-44-177-TC-715
Rept. on XV-5 Lift Fan Flight Research Aircraft Program. See also AD-639 231.

Descriptors: (*Vertical take-off planes, Flight testing), (*Research planes, Flight testing), Lift, Ducted fans, Stability, Thermodynamics, Aircraft equipment, Propulsion, Landing gear, Loading (Mechanics).

Identifiers: V-5 aircraft.

Contents: Conventional flight test results (Performance, Stability and control, Thermodynamics); Aircraft systems (Hydraulic, Electrical, Propulsion system history, XV-5A landing gear, Airspeed system); Structures and loads.

AD-639 233 **Field 1C**
CFSTI Prices: HC$6.00 MF$1.25
General Electric Co., Cincinnati, Ohio. Advanced Engine and Technology Dept.
PHASE I FLIGHT TEST RESULTS. VOLUME III.
Mar 66, 248p Rept. no. 166-Vol-3
Contract DA-44-177-TC-715
Rept. on XV-5 Lift Fan Flight Research Aircraft Program. See also AD-639 232.

Descriptors: (*Vertical take-off planes, Flight testing), (*Research planes, Flight testing), Graphics, Lift, Ducted fans, Stability, Flight control systems.

Identifiers: V-5 aircraft.

The Volume consists of Appendix Figures exclusively.

AD-639 255 **Field 1C**
CFSTI Prices: HC$3.00 MF$0.75
Norair Div., Northrop Corp., Hawthorne, Calif.
HIGH LIFT SURFACE DESIGN PROCEDURES. EXPERIMENTAL VERIFICATION. VOLUME I. SUMMARY AND EVALUATION.
by J. R. Stevens, J. W. McDonald, and J. W. Headley. May 66, 76p NOR-66-206
Contract NOw-65-0380-

Descriptors: (*Wings, Lift), Design, Performance (Engineering), Optimization, Surfaces, Model tests.

The main purpose of this work was to determine the performance gains of wings designed for optimized high lift by a new design procedure based on lifting surface theory for wings in steady subsonic flow. The theoretically predicted performance of the wings is compared with the wind tunnel test results and comparisons are made between these results and the performance of wings designed by other methods. The results indicated that the optimized high lift wing had greater lift to drag ratios in the high lift range of operation than cruise wings using high lift devices. The optimized high lift wing exhibited results comparable to the cruise wing when it was flapped to approximate the mean surface slope distribution of the cruise wing. The results also verified the computer programs and demonstrated that the new design procedure can be used for a wide range of lift coefficients. It is concluded that this new design procedure is superior to the old cut and dry methods. Also, if high lift is of prime importance in a mission, the penalties are less if the wing is designed for optimized high lift and flapped for low lift. (Author)

AD-639 289 **Field 1C**
CFSTI Prices: HC$4.00 MF$1.00
Norair Div., Northrop Corp., Hawthorne, Calif.
HIGH LIFT SURFACE DESIGN PROCEDURES. EXPERIMENTAL VERIFICATION. VOLUME II. THEORETICAL DESIGN AND ANALYSIS.
by J. R. Stevens, J. W. McDonald, and J. W. Headley. May 66, 126p NOR-66-206
Contract NOw-65-0380
See also AD-639 255.

Descriptors: (*Wings, Lift), Design, Analysis, Model tests, Surfaces, Camber.

The development of four wings which were designed to have specific aerodynamic requirements is described. The wings designed were: a high lift wing, a low lift or cruise wing, both of which were smooth, and two flapped wings which were approximations of the smooth wings.

AD-639 319 **Field 1C, 11I**
CFSTI Prices: HC$7.00 MF$1.75
North American Aviation, Inc., Columbus, Ohio.
DEVELOPMENT PROGRAM FOR A STRUCTURAL FIBER GLASS AIRCRAFT COMPONENT.
Rept. for 1963-1964.
by Lloyd E. Hackman, Charles L. Stotler, and D. Gene Worthington, Jun 66, 358p
Contract N156-43596
NAEC-ASL-1097

Descriptors: (*Jet training planes, Stabilizers (Horizontal tail surface)), (*Stabilizers (Horizontal tail surface), *Plastics), Glass textiles, Failure (Mechanics), Reinforcing materials, Joints, Metals.

Identifiers: T-2 aircraft.

The report contains information on a development program to determine the practicability of glass-fiber reinforced plastic (GFRP) structures. Specifically, the program involved the design, development, fabrication, and evaluation of GFRP versions of horizontal stabilizers for the T-2A trainer airplane. The program consisted of four primary phases--material selection and processing development, component design, component fabrication, and structural tests. Four metal stabilizers for the T-2A aircraft were procured and identical tests were performed on both the GFRP and metal stabilizers so that a comparison of the important structural factors could be made. The results of the program indicate that GFRP primary airframe structures are practicable when compared with metal structures, but that the structural reliability of these structures is low because of failure to obtain consistently adequate strength at bonded joints. Much more development work is required in design, fabrication techniques, and quality assurance procedures to improve reliability. (Author)

N66-24384 **Field 1C**
CFSTI Prices HC$2.00 MF$0.50
Schjeldahl (G. T.) Co., Northfield, Minn.
INVESTIGATION OF THE FLIGHT CHARACTERISTICS OF FREE FLYING AERODYNAMICALLY SHAPED BALLOONS FINAL REPORT.
by C. V. Eckstrom, 1965, 49p NASA-CR-66093
Contract NAS1-5271

Descriptors: *Aerodynamic characteristics, Aerodynamics, Altitude, Analysis, Balloon, *Balloon flight, Characteristics, Design, Flight, Free, *Free flight, Shape, Stability, Structure.

For abstract, see S 04 13.

N66-24408 **Field 1C**
CFSTI Prices HC$1.00 MF$0.50
Royal Netherlands Aircraft Factories Fokker, Amsterdam.
DYNAMIC BEHAVIOUR OF AIRCRAFT SEATS.
30 Mar 65, 18p FS-13

Descriptors: Belt, *Deceleration, Deformation, *Failure, Mass, Plastic, *Plastic deformation, Resistance, Safety, Seat, *Seat belt, Spring, Stretch.

For abstract, see S 04 13.

N66-24560 **Field 1C, 1A**
CFSTI Prices HC$1.00 MF$0.50
Royal Netherlands Aircraft Factories Fokker, Amsterdam.
THE FOKKER F-28 FELLOWSHIP TECHNICAL PAPER NO. 512.
by J. H. Greidanus, 1965, 25p
Presented At The 24th Ann. Conf. Of Sawe, Denver, May 1965

Descriptors: Aerodynamic, *Aerodynamic characteristics, Aircraft, Characteristics, Configuration, Control, Design, *Fokker f-28 aircraft, Loading, Maneuverability, Passenger, Performance, Size, Stability, Structural, *Structural design, System, Transportation, Turbofan, *Turbofan aircraft, Weight.

For abstract, see S 04 13.

N66-24606 **Field 1C**
CFSTI Prices HC$5.25 MF$2.25
National Aeronautics And Space Administration. Ames Research Center, Moffett Field, Calif.
CONFERENCE ON V/STOL AND STOL AIRCRAFT.
1966, 461p NASA-SP-116
Conf. Held 4-5 Apr. 1966

Descriptors: Aerodynamic, *Aerodynamic characteristics, Aircraft, Characteristics, *Conference, Feasibility, Flight, Handling, *Handling quality, Performance, *Perfor-

mance characteristics, Propulsion, *Propulsion system, Quality, Research, *Stol aircraft, Study, System, Testing, V/stol, *V/stol aircraft, Vtol, *Vtol aircraft, Wind tunnel.

For abstract, see S 04 13.

N66-26275 **Field 1C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
AN EXPLORATORY INVESTIGATION OF FACTORS AFFECTING THE HANDLING QUALITIES OF A RUDIMENTARY HINGELESS ROTOR HELICOPTER.
by R. J. Huston. May 66, 41p NASA-TN-D-3418

Descriptors: Control, *Control stability, Coupling, Damping, Flight, *Flight test, Handling, *Helicopter, Hingeless, Pitch, Roll, Rotor, Rudimentary, Stability, Test.

For abstract, see S 04 14.

N66-26849 **Field 1C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Flight Research Center, Edwards, Calif.
MEASURED AND CALCULATED FLOW CONDITIONS ON THE FORWARD FUSELAGE OF THE X-15 AIRPLANE AND MODEL AT MACH NUMBERS FROM 3.0 TO 8.0.
by M. Palitz. Jun 66, 46p NASA-TN-D-3447

Descriptors: Angle of attack, Conical, Flow, *Fuselage, Hypersonic, *Hypersonic flow, *Mach number, Model, Shock, Supersonic, *Supersonic flow, Tunnel, Wind, *X-15 aircraft, Zero.

For abstract, see S 04 14.

N66-26857 **Field 1C**
CFSTI Prices HC$2.00 MF$0.50
Arizona Univ., Tucson.
APPLICATIONS OF THE CALCULUS OF VARIATIONS TO AIRCRAFT PERFORMANCE.
by T. Ishihara, F. Lutze, and T. L. Vincent. May 66, 41p NASA-CR-499
Grant NSG-580

Descriptors: Aircraft, Analog, Calculus, Computer, Equation, Flight, *Flight path, Model, *Optimization, Path, *Trajectory, Variation, *Variational calculus.

For abstract, see S 04 14.

N66-26859 **Field 1C**
CFSTI Prices HC$3.00 MF$0.75
Bolt, Beranek, And Newman, Inc., Van Nuys, Calif.
A WIND TUNNEL INVESTIGATION OF PANEL RESPONSE TO BOUNDARY LAYER PRESSURE FLUCTUATIONS AT MACH 1.4 AND MACH 3.5.
by D. A. Bies. May 66, 82p NASA-CR-501
Contract NASW-932

Descriptors: Aerodynamics, Boundary, Engineering, Flow, Fluctuation, Layer, *Panel, Pressure, Response, Structural, Supersonic, *Supersonic flow, Tunnel, Turbulent, *Turbulent boundary layer, Wind, *Wind tunnel.

For abstract, see S 04 14.

N66-34101 **Field 1C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
LOW-SPEED INVESTIGATION OF THE EFFECT OF SMALL CANARD SURFACES ON THE DIRECTIONAL STABILITY OF A SWEPTBACK-WING FIGHTER-AIRPLANE MODEL.
by P. C. Boisseau, and J. W. Paulson. 23 Aug 56, 26p NACA-RM-L56F19A

Descriptors: Aircraft, *Canard, Direction, *Directional stability, Fighter, *Fighter aircraft, Flight, Free, *Free flight, Low speed, *Low speed wind tunnel, Stability, Surface, Sweep, *Swept wing, Testing, Tunnel, Wind, Wing.

For abstract, see S 04 20.

N66-34103 **Field 1C**
CFSTI Prices HC$3.25 MF$1.00
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
EFFECTS OF COMPONENTS AND VARIOUS MODIFICATIONS ON THE DRAG AND THE STATIC STABILITY AND CONTROL CHARACTERISTICS OF A 42 DEG SWEPT-WING FIGHTER-AIRPLANE MODEL AT MACH NUMBERS OF 1.60 TO 2.50.
by J. D. Church. 15 Apr 59, 167p NACA-RM-L57K01

Descriptors: Aircraft, Characteristics, Control, Drag, *Drag measurement, Fighter, *Fighter aircraft, Lateral, Longitudinal, Mach number, Measurement, Model, Stability, Static, *Static stability and control, Sweep, *Swept wing, Test, Tunnel, Wind, *Wind tunnel stability test, Wing.

For abstract, see S 04 20.

AD-409 097 **See Field 11I**

AD-638 986 **See Field 21E**

AD-639 026 **See Field 5E**

AD-639 235 **See Field 1A**

AD-639 236 **See Field 1A**

PB-170 387 **See Field 1B**

1D. AIRCRAFT FLIGHT CONTROL AND INSTRUMENTATION

AD-638 794 **Field 1D, 5E**
CFSTI Prices: HC$2.00 MF$0.50
Naval Air Development Center, Johnsville, Pa. Aero Mechanics Dept.
EXPERIMENTAL RESULTS OF A SIMULATED FLIGHT TEST USING VARIOUS CONTACT ANALOG TEXTURE FORMATS.
Final rept.
by Vincent E. Lafranchi. 2 Aug 66, 35p NADC-AM-6645
Task RAV09J011/2021/F012-04-04

Descriptors: (*Pilots, Performance (Human)), (*Flight instruments, Display systems), (*Display systems, Human engineering), Command guidance, Flight simulators, Errors, Analysis of variance, Sky, Cockpits, Terrain, Flight testing, Analog systems.

The experiment was performed to investigate whether synthetic ground and sky textures, displayed on a contact analog display, affect the ability of the pilot to follow command symbols presented to him during flight. Ninety-six laboratory simulated flights were flown and errors from prescribed path were recorded on magnetic tape. The data was reduced by a CDC 3200 computer and an analysis of variance was performed. The analysis indicated that no significant changes in errors occurred for the four combinations of ground and sky textures displayed. (Author)

AD-639 028 **Field 1D, 5E**
CFSTI Prices: HC$7.60 MF$0.75
Psychological Corp., New York.
THE HUMAN FACTOR IN THE DESIGN OF STICK AND RUDDER CONTROLS FOR AIRCRAFT.
by Jack W. Dunlap. 3 Feb 48, 80p
Contract N6ori-151 (01)
Proj. 20-M-1c
SPECDEVCEN-151-1-8

Descriptors: (*Aerial rudders, Human engineering), (*Flight control systems, Human engineering), Aircraft, Design, Motor reactions, Reflexes, Force (Mechanics), Performance (Human).

The study is an attempt to determine how airplane control systems may be designed to provide the pilot with optimal sensory information by means of pressure cues obtained from operating the stick and rudder. The present approach to the problem consists of an examination and evaluation of literature pertaining to (a) the maximum forces that may be exerted by a human pilot; (b) human reaction time insofar as it may be expected to cause delays in the pilot's response; (c) the optimal design, placement, and manner of movement of controls, and (d) the optimal gradients of control forces. (Author)

PB-172 401 **Field 1D, 4A**
CFSTI Prices: HC$3.00 MF$0.75
Federal Aviation Agency, Washington, D. C. Systems Research and Development.
DEVIATIONS FROM STANDARD ALTITUDE SEPARATIONS DUE TO ATMOSPHERIC TEMPERATURE VARIATIONS.
Final rept.
by Arthur Hilsenrod. Jul 66, 65p RD-65-12

Descriptors: (*Altimeters, Errors), (*Altitude, Barometric pressure), Pilots, Separation, Thickness, Atmospheric temperature.

In order to provide a firmer basis for evaluating standards for vertical separations, e.g., permit 1,000 foot separations above 29,000 feet, a determination is made of the deviations from the assumed 1,000 foot standard vertical separations of aircraft when actual atmospheric temperature distributions are considered. Other errors contributing to the variations of vertical separation are not considered. The assumed 1,000 foot standard vertical separation is decreased to less than 900 feet with some frequency over some localities at certain times of the year at some altitudes because of the occurrence of temperatures 10% below the standard temperature. (Author)

PB-172 419 **Field 1D**
CFSTI Prices: HC$1.60 MF$0.50
Wright Air Development Center, Wright-Patterson AFB, Ohio.
GREENLAND ICE CAP TESTS OF ELECTRONIC ALTIMETERS.
Technical rept.
by Henry B. Worth. Jul 59, 15p WADC-TR-59-318
AD-225 122

Descriptors: (*Radio altimeters, Flight testing), Performance (Engineering), Radar reflections, Ice, Surface area, Greenland.

Identifiers: APN-1, APN-22.

The report summarized a flight-test program of Radar Sets APN-1 and APN-22 low -altitude f-m radio altimeters over the Greenland ice cap. The tests were conducted in cooperation with the Air Rescue Service. It was determined that the altimeters were accurate over water, runways, frozen soil, rocks, hard-packed trails and ice-covered rocks and soil. However, accuracy was greatly impaired over terrain consisting of loosely packed snow. At an estimated 10- to 20- foot clearance of these snow areas the APN-1 read between 100 and 180 feet, while simultaneously, the APN-22 read between 50 and 75 feet. The lower error of the APN-22 is considered to be due to its operation at microwaves while the APN-1 operates at UHF. The phenomena was demonstrated repeatedly at several sites. In addition, the APN-1 installed in an SA-16 was test flown over still other

areas of the ice cap. At an estimated clearance of between 90-100 feet the APN-1 read between 250 and 325 feet. Maintenance procedures of the APN-1 in the C and E shop of the 55th Air Rescue Squadron were found to be very poor. The APN-1 normally carried aboard the three SA-16's assigned to this squadron were found to be nonoperational. These equipments were repaired and realigned and personnel of the shop were trained in theory, operation, and maintenance of the altimeter. (Author)

PB-172 893 **Field 1D, 4A**
CFSTI Prices: HC$3.00 MF$0.75
Federal Aviation Agency, Washington, D. C. Systems Research and Development Service.
DEVIATIONS FROM STANDARD ALTITUDE SEPARATIONS DUE TO ATMOSPHERIC TEMPERATURE VARIATIONS.
Final rept.
by Arthur Hilsenrod. Jul 66, 65p RD-65-12
Proj. 115-23-2R

Descriptors: (*Altimeters, Errors), (*Atmospheric temperature, Altimeters), Analysis of variance, Aircraft, Separation, Barometric pressure.

In order to provide a firmer basis for evaluating standards for vertical separations, e.g., permit 1,000 foot separations above 29,000 feet, a determination is made of the deviations from the assumed 1,000 foot standard vertical separations of aircraft when actual atmospheric temperature distributions are considered. Other errors contributing to the variations of vertical separation are not considered. The assumed 1,000 foot standard vertical separation is decreased to less than 900 feet with some frequency over some localities at certain times of the year at some altitudes because of the occurrence of temperatures 10% below the standard temperature. (Author)

1E. AIR FACILITIES

AD-639 565 **Field 1E**
CFSTI Prices: HC$1.00 MF$0.50
Federal Aviation Agency, Washington, D. C.
ACCESS TO AIRPORTS: SELECTED REFERENCES.
by Louise K. Annus. Aug 66, 11p Bibliographic list-12

Descriptors: (*Airports, Transportation), (*Transportation, Bibliographies), Urban planning, Passenger vehicles, Air transportation, Railroads, Shipping (Marine), Abstracts.

Contents: Air transportation; Motor transportation; Rail transportation; Water transportation.

PB-169 120 **Field 1E, 4B, 17I**
CFSTI Prices: HC$2.00 MF$0.50
Raytheon Co., Wayland, Mass.
ARSR WEATHER SURVEILLANCE RADAR KIT.
Final rept.
by Edward H. R. Paro. Oct 65, 45p
Contract FA-64-WA-5138
Proj. FAA-241-001-01C
SRDS-RD-65-114

Descriptors: (*Meteorological radar, Air traffic control systems), (*Air traffic control systems, Meteorological radar), Storms, Antennas, Display systems.

The ARSR Weather Surveillance Radar Kit provides the ARSR-1E radar with weather data covering the identical enroute airway area normally covered by the Air Traffic Surveillance Radar. The weather intelligence is in the form of three coded iso-amplitude contours thresholded to display weather amplitude gradients. A circular linear polarizer allowing for two separate and orthogonal outputs provides separation of intelligence. Thus, in a severe weather environment the weather clutter enters the separate weather kit channel but does not interfere with the normal removal of weather clutter from the main radar channel. The weather signals are processed independently of the radar MTI and normal receivers, however, the kit has the additional advantage of using many of the component types and circuits of the ARSR. This ensures performance reliability, lessens the stocking of spare parts, and simplifies maintenance and training, thus reducing repair time. The weather kit prototype model, and the resultant techniques developed for utilizing the display and data, will provide the FAA Air Traffic Controller with the ability to route aircraft around or through storm systems in the radar control area. (Author)

PB-170 402 **Field 1E, 5K**
CFSTI Prices: HC$7.00 MF$1.75
Bolt Beranek and Newman, Inc., Van Nuys, Calif.
ANALYSIS OF COMMUNITY AND AIRPORT RELATIONSHIPS. NOISE ABATEMENT.
Final technical rept. for May 64-Apr 65.
by Dwight E. Bishop, Fremont J. Lyden, and Richard D. Horonjeff. Dec 65, 347p
Contract FA-WA-4409
Proj. 430-001-01R
SRDS-RD-65-130

Descriptors: (*Airplane noise, Public opinion), (*Airports, Airplane noise), Flyby, Auditory perception, Decision making, Law, Jet plane noise, Inhibition, Environments, Takeoff, Flight paths, Atmosphere, Sound, Propagation, Urban planning.

Identifiers: Noise reduction.

Contents: Predicting community response to aircraft noise; Judgments of the relative and absolute acceptability of actual and recorded aircraft noise; An analysis of some factors affecting community-airport decision-making; The reduction of aircraft noise measured in several schools, motel and residential rooms; Computer-aided study of time patterns of noise from jet aircraft takeoffs; A study of aircraft flyover noise variations due to changes in flight paths and atmospheric sound transmission characteristics; Applications of methods for rating land use compatibility with aircraft noise.

AD-638 723 **See Field 17G**

PB-170 395 **See Field 17B**

2D. AGRONOMY AND HORTICULTURE

AD-639 401 **See Field 6C**

3A. ASTRONOMY

AD-639 025 **Field 3A, 20H**
Not available from CFSTI.
Center for Radio Physics and Space Research, Cornell Univ., Ithaca, N. Y.
INVERSE COMPTON RADIATION FROM INTERGALACTIC ELECTRONS AND COSMIC BLACKBODY PHOTONS.
by James E. Felten. 12 Nov 65, 5p
Contract AF 49 (638)-1527
Proj. AF-9767
Task 976702
AFOSR-66-1710
Availability: Published in Physical Review Letters v15 n26 p1003-5 Dec 27 1965.

Descriptors: (*Cosmic rays, *Compton scattering), X rays, Gamma rays, Microwaves, Electrons, Photons, Blackbody radiation, Galaxies, Radio astronomy.

Cosmic microwave radiation is discussed as a possible source of the isotropic component of cosmic x-rays, via the inverse Compton interaction of the microwave photons with fast electrons in our galaxy. It is shown that a more natural explanation of the x radiation may be given in terms of intergalactic rather than galactic electrons, and also that in this model the presence of the microwave photons may provide an explanation for an otherwise puzzling feature in the cosmic gamma-ray spectrum. (Author)

AD-639 132 **Field 3A**
Not available from CFSTI.
National Research Council of Canada, Ottawa (Ontario). Div. of Radio and Electrical Engineering.
THE GAMMA-CYGNI REGION OF THE CYGNUS X RADIO SOURCE.
by L. A. Higgs. 2 Apr 65, 13p
NRC-8828
Prepared in cooperation with Leiden Observatory (Netherlands).
Availability: Published in Mon. Not. R. astr. Soc. v132 p67-78 1966.

Descriptors: (*Radio astronomy, *Stars), (*Extraterrestrial radio waves, Stars), Scanning, Radiofrequency spectroscopy, Emissivity, Canada, Netherlands.

Identifiers: Gamma Cygni.

A high resolution survey of the Gamma-Cygni region of the Cygnus X radio source was carried out at a wavelength of 4.6 cm using the 10 metre paraboloid at the Algonquin Radio Observatory. Comparison of these results with two other surveys of comparable resolution indicates that one, and possibly two, sources in the region radiate by a different mechanism than the Cygnus X sources in general. One is the strong source which has been termed the 'Gamma-Cygni source', and the other is a weaker source situated 40 feet to the northwest of this. These may be components of the same emission feature. Aside from these, twenty-nine other emission peaks have been identified in the surveyed region. Electron densities and masses of ionized gas have been derived for these on the assumption that the Cygnus X complex is at a distance of 1 500 parasecs. An average electron density of 25/cu.cm. was found for the resolved sources in this area of Cygnus X, and by comparison with optical observations a mean visual absorption of 1.5m was deduced for the western half of the surveyed area. The mass of ionized hydrogen in the whole Cygnus X complex is estimated to be 600,000 solar masses. (Author)

AD-639 156 **Field 3A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
UNIQUE PHOTO TAKEN OF THE MOON IN EARTHSHINE WITH THE ZENITH-S CAMERA.
13 Jun 66, 5p FTD-HT-66-119
TT-66-62284
Unedited rough draft trans. from Izvestiya (USSR) p4 3 Jun 1964.

Descriptors: (*Moon, Photographic analysis), Luminescence, Brightness, USSR.

A brief, journalistic account is given of a successful attempt to photograph the lunar disk by earthshine. The exposures were made at high altitude in North Pimar. Photometric scanning of the plates revealed that certain areas of the lunar surface, situated in the eastern and northeastern extremes, have an increased brightness under earthshine.

AD-639 267 **Field 3A**
Not available from CFSTI.
Center for Radiophysics and Space Research, Cornell Univ., Ithaca, N. Y.
RADIOMETRIC OBSERVATIONS OF VENUS AND MARS AT 430 MC/S.
by Harry E. Hardebeck. 21 Oct 65, 5p
Contract AF 49 (638)-1156
Proj. AF-2838
AFOSR-66-1526
Availability: Published in The Astrophysical Journal v142 n4 p1696-8 Nov 15 1965.

Descriptors: (*Venus (Planet), Radiometers), (*Mars (Planet), *Radiometers), Radio astronomy, Blackbody radiation, Temperature, Puerto Rico.

Observation of Venus near inferior conjunction in 1964 and of Mars near the opposition of 1965 were made at the Arecibo Ionospheric Observatory at 430 Mc/sec. The average black-body temperature of Venus was found to be 518 plus or minus 40K. No radiation from Mars was detected in these observations A recomputation of results previously reported for Jupiter indicate that its blackbody disk temperature is 28900K plus or minus 2700K. (Author)

AD-639 268 **Field 3A**
Not available from CFSTI.
Center for Radiophysics and Space Research, Cornell Univ., Ithaca, N. Y.
RECENT ARECIBO OBSERVATIONS OF MARS AND JUPITER.
by R. B. Dyce. 1966. 3p
Contract AF 49 (638)-1156
Proj. AF-2838
AFOSR-66-1706
Availability: Published in Radio Science v69D n12 p1628-9 Dec 1965.

Descriptors: (*Mars (Planet), *Radio astronomy), (*Jupiter (Planet), Radio astronomy), Radar reflections, Doppler effect, Puerto Rico.

Radar range and Doppler spectrum measurements of Mars and Jupiter in 1964 and 1965 are reported. (Author)

AD-639 485 **Field 3A, 20F**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
THE INVESTIGATION OF THE PULKOVO POLARIMETER AND ASI-4 CHAMBER.
by E. K. Kokhan. 6 Jun 66, 20p FTD-TT-65-1095
TT-66-62347
Unedited rough draft trans. of Glavnaya Astronomicheskaya Observatoriya, Pulkovo. Izvestiya (USSR) v23 n5 p86-92 1964.

Descriptors: (*Polariscopes, Design), (*Astronomical cameras, Design), Amplifiers, Sensitivity, Optical properties, Polarizing filters, USSR.

In order to increase the precision of measurements of polarized light improvements were made in the design of the electropolarimeter based on V. I. Myuhkyurya's system. The amplification coefficient of the amplifier and the current and voltage sensitivities of the electropolarimeter were determined. The light sensitivity of the electropolarimeter, spectral characteristic of the ASI-4 camera, spectral response of the electropolarimeter and spectral characteristic of the polaroid were investigated. The errors of measurements of polarization due to the electropolarimeter and the ASI-4 camera were computed. (Author)

N66-24245 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
Uppsala Univ. (Sweden).
THE UPPSALA SPECTRAL CLASSIFICATION AND THE INTERSTELLAR ABSORPTION IN A REGION NEAR THE GALACTIC POLE.
by B. Ljunggren. 1966. 12p
Abstracts Of Uppsala Dissertations In Sci. No. 66 Its Medd. No. 154

Descriptors: Absorption, *Astronomy, Classification, Cloud, Cluster, *Galaxy, Giant, *Giant star, Layer, Luminosity, Magnitude, Red, Spectrophotometry, Spectrum, Star, Stellar, *Stellar spectrophotometry.

For abstract, see S 04 13.

N66-24333 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
Konkoly Observatory, Budapest (Hungary).
PHOTOMETRIC LIGHT-CURVES OF SOUTHERN BV- STARS.
by E. Schoffel. 27 Dec 65, 23p
Its Inform. Bull. On Variable Stars No. 118

Descriptors: Amplitude, Curve, *Ephemeris, Light, Magnitude, Maximum, Minimum, *Photometry, South, *Star.

For abstract, see S 04 13.

N66-24391 **Field 3A**
CFSTI Prices HC$2.00 MF$0.50
Melpar, Inc., Falls Church, Va.
ANALYSIS OF THE F-CORONA ACCORDING TO THE MIE THEORY. MATHEMATICAL FORMULATION AND UNIQUENESS OF THE DERIVED THEORETICAL MODELS.
by R. R. Circle, and R. S. Powell. May 66, 43p
NASA-CR-469
Contract NASW-1206

Descriptors: Analysis, Angle, Corona, F region, Formulation, *Integral, Light, *Mathematical model, Mathematics, Mie theory, Model, Observation, Particle, *Particle size, *Scattering, Size, Zodiac, *Zodiacal light.

For abstract, see S 04 13.

N66-24401 **Field 3A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A LUNAR EPHEMERIS, WITH THE EARTH'S EQUATORIAL PLANE AS REFERENCE.
by T. L. Felsentreger. Mar 66, 26p NASA-TM-X-55465, X-547-66-94

Descriptors: Analysis, Angular, *Angular motion, Daily, Earth, Element, *Ephemeris, Equator, Harmonic, Lunar, *Lunar orbit, Moon, Motion, Orbit, *Orbital element, Plane, Reference.

For abstract, see S 04 13.

N66-24406 **Field 3A**
CFSTI Prices HC$2.00 MF$0.50
Defence Research Board, Ottawa (Ontario).
THE QUESTION OF THE TECTONIC ORIGIN OF LINEAR FORMATIONS ON MARS.
by G. N. Katterfeld. Apr 66, 34p T-445-R
Transl. Into English From Izv. Vses. Geogr. Obshch. (Moscow), V. 91, No. 3, 1959 P 272-283

Descriptors: Compression, Evolution, Fault, Geology, Gravitational, *Mars (planet), Movement, Origin, Planetary, *Planetary evolution, Rotation, *Tectonic movement, Tectonics.

For abstract, see S 04 13.

N66-24643 **Field 3A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NEAR INFRARED SOLAR ECLIPSE OBSERVATIONS.
by J. Mangus, and R. Stockhausen. Jan 66, 34p
NASA-TM-X-55451, X-614-66-29

Descriptors: Chromosphere, Corona, Eclipse, Emission, Infrared, Interferometer, Line, Near, *Near infrared, Observation, Solar, *Solar eclipse, *Solar spectrum, Spectral, *Spectral emission, Spectrum.

For abstract, see S 04 13.

N66-24645 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MONOCHROMATIC PICTURES OF THE SUN IN THE MG II LINE AT 2802.7 ANGSTROM.
by K. Fredga. Feb 66, 16p NASA-TM-X-55455, X-614-66-45
Submitted For Publication

Descriptors: Absorption, Activity, *Aerobee rocket, Birefringence, Chromosphere, Doublet, *Filter, Filtergram, *Heliography, Ionization, Line, Magnesium, Monochromatic, Resonance, Solar, *Solar spectrum, Spectrum, Ultraviolet, *Ultraviolet spectrum.

For abstract, see S 04 13.

N66-24867 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
Ankara Univ. (Turkey).
STUDY OF RADIOELECTRIC RADIATION FROM TWO AREAS OF OUR GALAXY.
Etude Du Rayonnement Radioelectrique De Deux Regions De La Galaxie
by G. Bourgois, A. N. Eskioglu, I. Kazes, and Nguyen-quang-rieu. Jun 65, 18p REPT.-46
In French Publ. De L'observatoire De Paris, Pt. 27, No. 4

Descriptors: Cassiopeia constellation, Celestial, *Celestial observation, Constellation, Density, Emission, Flux, *Flux density, *Galaxy, Gauss, Interferometer, Isophote, Observation, Radiation, Radio, *Radio telescope, Telescope, Thermal.

For abstract, see S 04 13.

N66-24869 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
REPORTS OF THE ASTRONOMICAL OBSERVATORY AND THE ASTROPHYSICAL LABORATORY ANNUAL REPORT, 1965.
by J. Junkes, and D. J. Oconnell. 1966, 16p

Descriptors: Astronomical, *Astronomical observatory, Astronomy, Computer, *Instrumentation, Observatory, Photoelectric, Photometry, Programming, Spectrography, *Telescope.

For abstract, see S 04 13.

N66-24881 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
Observatorium Bosscha, Bandung (Indonesia).
A PHOTOMETRIC STUDY OF THE GALACTIC CLUSTER NGC 6124.
by P.-S. The. 1965, 23p
Indonesia, V. 3, No. 4, 1965 23 P Refs Its Contrib. No. 33

Descriptors: Age, Cluster, Color, Determination, Distance, Galaxy, Luminosity, Magnitude, Measurement, Photoelectric, *Photoelectric photometry, Photographic, *Photographic measurement, Photometry, Star, *Star cluster, Stellar, *Stellar luminosity, Visual.

For abstract, see S 04 13.

N66-24900 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
Crimean Astrophysical Observatory (Ussr).
ON THE VARIABILITY OF HD 234677.
by P. F. Chugainov. 27 Feb 66, 8p
Comm. 27 Of The I.a.u. Inform. Bull. On Variable Stars No. 122

Descriptors: *Astronomy, Astrophysics, Binary, Calcium, Emission, Flare, Line, Magnitude, Photoelectricity, Photometry, Spectroscope, Star, Variable, *Variable star.

For abstract, see S 04 13.

N66-24913 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.

SPECTROPHOTOMETRIC COMPARISON OF MARTIAN CONTINENTS WITH RED-COLORED TERRESTRIAL CAPROCK.
Spektrofotometricheskoye
S ravneniye Materikov Marsa S Krasnotsvetnymi Zemnymi Pokrovami
by I. I. Lebedeva. Apr 66, 15p NASA-TT-F-10081
Transl. Into English From Tr. Astron. Observ., Ser. Mat. (Leningrad), V. 22, No. 39, 1965 P 125-131

Descriptors: Analysis, Atmospheric, Earth, *Earth surface, Effect, Limonite, Mars, *Mars surface, Optical, Planet, Radiation, Red, Rock, Spectral, *Spectral analysis, *Spectrophotometry, Surface, Visible, *Visible radiation.

For abstract, see S 04 13.

N66-24927 **Field 3A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CHRONOLOGICAL LISTING OF LUNAR EVENTS.
by J. M. Burley, and B. M. Middlehurst. Apr 66, 46p NASA-TM-X-55470, X-641-66-178

Descriptors: Bibliography, Change, *Chronology, Event, *History, Lunar, *Lunar surface, *Moon, Observation, Surface, Temporary.

For abstract, see S 04 13.

N66-25404 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
Specola Vaticana (Vatican City).
STRUCTURAL DETAIL IN A REGION NEAR THE ANTICENTRE.
by M. F. Mc Carthy, and P. J. Treanor. 1965, 25p
Its Ric. Astronomiche, Vol. 7, No. 3

Descriptors: Absorption, Density, Distance, Distribution, Emission, *Galaxy, Magnitude, Prism, Radial, Spectrum, Star, *Star cluster, Stellar, *Stellar spectrum, Surface, Telescope, Velocity.

For abstract, see S 04 14.

N66-25458 **Field 3A**
CFSTI Prices HC$6.00 MF$1.50
Instituto Y Observatorio Astronomico De Marina, San Fernando (Spain).
AERONAUTICAL ALMANAC, JANUARY APRIL 1966.
Almanaque Aeronautico, Enero - Febrero - Marzo - April, 1966
1965, 274p
In Spanish

Descriptors: *Astronomical coordinate, Astronomy, Celestial, *Celestial observation, coordinate, Data, Jupiter, Mechanics, Meridian, Moon, Observation, Orbit, Planetary, *Planetary orbit, Position, Saturn, Spain, Star, Sun, Sunset, *Table, Venus.

For abstract, see S 04 14.

N66-25463 **Field 3A, 3C**
CFSTI Prices HC$8.53 MF$2.75
Instituto Y Observatorio Astronomico De Marina, San Fernando (Spain).
ASTRONOMICAL EPHEMERIS FOR 1966.
Efemerides Astronomicas Ano 1966
1965, 554p
In Spanish Its Vol. 175

Descriptors: Astronomy, Calendar, Celestial, *Celestial observation, Eclipse, *Ephemeris, Interval, Lunar, *Lunar eclipse, Observation, Occultation, Planet, Position, Satellite, Solar, Spain, Stellar, *Stellar occultation, Sunrise, Sunset, Table.

For abstract, see S 04 14.

N66-25483 **Field 3A**
CFSTI Prices HC$5.00 MF$1.00
Specola Vaticana (Vatican City).
GALACTIC COORDINATES FOR THE STARS IN THE GENERAL CATALOGUE OF RADIAL VELOCITIES.
by F. C. Bertiau, J. M. Burley, and M. F. Mc carthy. 1965, 160p
Its Ric. Astronomiche, Vol. 7, No. 2

Descriptors: *Astronomical coordinate, *Astronomy, Catalog, Data, Error, *Galaxy, Kinematics, Observation, Position, Punch, Spectrum, Star, Stellar, *Stellar spectrum, *Table, Tape, Velocity.

For abstract, see S 04 14.

N66-25647 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
Republic Observatory, Johannesburg (South Africa).
REPUBLIC OBSERVATORY CIRCULARS, VOLUME 7, NUMBER 124.
1965, 24p

Descriptors: Angle, *Astronomy, Binary, *Binary star, Celestial, *Celestial observation, *Comet, Ephemeris, Epoch, Exploration, Interferometer, Magnitude, Measurement, Micrometer, Minor, Observation, Photographic, Planetary, *Planetary orbit, Position, Star, *Table.

For abstract, see S 04 14.

N66-26742 **Field 3A**
CFSTI Prices HC$6.00 MF$1.50
Coimbra Univ. (Portugal).
ASTRONOMICAL TABLES FOR THE YEAR 1965.
Efemerides Astronomicas Paro O Ano De 1965
1965, 246p
In Portuguese

Descriptors: Aspect, *Astronomy, Constant, Eclipse, *Ephemeris, Lunar, *Moon, Motion, Planetary, *Planetary motion, Position, Solar, Stellar, *Stellar motion, *Sun, Table, Time.

For abstract, see S 04 14.

N66-34521 **Field 3A**
CFSTI Prices HC$1.00 MF$0.50
Defence Research Board, Ottawa (Ontario).
MODELING THE TUNGUS METEORITE EXPLOSION.
by M. A. Cikulin, and I. T. Zotkin. May 66, 7p T-458-R, TT-66-61511
Transl. Into English From Dokl. Akad. Nauk Sssr (Moscow), V. 167, No. 1, 1966 P 59-62

Descriptors: Cratering, Damage, Explosion, Extraterrestrial, Impact, *Meteorite, Modeling, Plant (biol), Shock, *Topography.

For abstract, see S 04 20.

N66-34700 **Field 3A**
CFSTI Prices HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
A DIGITALIZED SOLAR ULTRAVIOLET SPECTRUM.
by C. A. Barth, R. T. Brinkmann, and A. E. Green. 15 Aug 66, 86p NASA-CR-77355, JPL-TR-32-951
Contract NAS7-100

Descriptors: Atmosphere, Conversion, Data, Digital, *Digital data, Film, Graph, Rocket, Solar, *Solar spectrum, Spectrometry, Spectrum, Table, Ultraviolet, *Ultraviolet spectrum, Upper, *Upper atmosphere.

For abstract, see S 04 20.

N66-34786 **Field 3A**
CFSTI Prices HC$0.45 MF$0.75
National Aeronautics And Space Administration, Washington, D. C.
SIGNIFICANT ACHIEVEMENTS IN SPACE ASTRONOMY 1958-1964.
1966, 71p NASA-SP-91

Descriptors: Astronomy, Balloon, Gamma, *Gamma radiation, Infrared, *Infrared astronomy, Low frequency, Radiation, *Radio astronomy, Rocket, Satellite, Space, Telescope, *Ultraviolet spectrum, X-ray, *X-ray astronomy.

For abstract, see S 04 20.

AD-639 348 **See Field 17H**

3B. ASTROPHYSICS

AD-638 747 **Field 3B, 7D**
CFSTI Prices: HC$2.00 MF$0.50
North Carolina State Univ., Raleigh. Physical Science Research.
TEMPERATURE DEPENDENCE OF THE ABSORPTANCE OF AMMONIA NEAR 850/CM.
Interim rept.
by A. K. Rogers, E. R. Manring, and R. R. Patty. May 66, 47p Scientific-2
Contract AF 19 (628)-3898
Projs. AF-8603, PSR-22
Task 860303
AFCRL-66-458

Descriptors: (*Ammonia, Absorption spectrum), (*Jupiter (Planet), *Planetary atmospheres), (*Infrared spectroscopy, Ammonia), Band spectrum, Temperature, Instrumentation.

The equipment and experimental techniques used to observe the temperature dependence of absorptance in a small region of the 950/cm band of ammonia are described. The integrated absorptance of two spectral lines was measured at 214K and 300K for samples of pure ammonia and samples of ammonia broadened with nitrogen. The results are presented as plots of total absorptance for the small spectral region versus absorber concentration u and total pressure P. An equivalent pressure Pe is expressed in terms of a self-broadening coefficient B which is a function of the ratio of the optical collision diameters. Self-broadening coefficients are determined at 214K and 300K. Integrated absorptances at 300K are compared with those obtained for samples at 214K to determine whether the temperature dependence is that predicted by the Lorentz theory. (Author)

AD-638 784 **Field 3B**
Not available from CFSTI.
Oslo Univ. (Norway). Inst. of Theoretical Astrophysics.
ON THE VELOCITY FIELD OF SUNSPOTS.
by Per Maltby. Nov 65, 14p Scientific-9
Contract AF 61 (052)-743
AFCRL-66-591
Availability: Published in Journal unknown.

Descriptors: (*Sunspots, Velocity), Data.

Some results are reported from the observation of the velocity fields in 4 large, isolated sunspots and 3 sunspot groups. (Author)

AD-638 864 **Field 3B**
Not available from CFSTI.
Palomar Observatory, Pasadena, Calif.
OBSERVATIONS OF PROPER-MOTION STARS. II.
Revised ed.
by Jesse L. Greenstein, and Olin J. Eggen. 12 May 65, 11p

Contract AF 49 (638)-1323
Proj. AF-9774
Task 977401
AFOSR-66-1252
Prepared in cooperation with Royal Greenwich Observatory, Herstmonceux (England), and Mount Wilson Observatory, Pasadena, Calif.
Revision of Manuscript submitted 1 Mar 65.
Availability: Published in The Astrophysical Journal v142 n3 p925-33 Oct 1 1965.

Descriptors: (*Celestial mechanics, *Stars), Astrophysics, Optical properties, Astronomical data.

In the course of an observational program on white dwarfs, results of which have been reported earlier in Paper I (Ap.J., 141:83 (1965)), colors and spectra of many non-white dwarfs were obtained. A few wide binaries are found to be optical pairs only and the data for these pairs are given. New physical pairs containing white dwarfs were established, and new single white dwarfs were discovered spectroscopically and are listed. This paper lists twelve newly observed white dwarfs of spectral types DA and DF and gives further observations on two stars from our earlier work. The RR Lyr variable, AP Ser, is also a visual binary. Photometric observations of the faint, physical companion give delta (U-B)=+0.12 (m) and lead to a luminosity of Mv=+1.6 (m) at median light of the variable. Stars found not to be white dwarfs during our earlier survey of proper-motion stars are listed. Lowell survey colors were also studied statistically and found to be moderately reliable. Proper-motion stars of color class -1 and most of those of color class 0 are almost certainly white dwarfs. Also, some interesting subdwarf M stars were found, with weak TiO and strong MgH bands. (Author)

AD-638 865 **Field 3B**
Not available from CFSTI.
Palomar Observatory, Pasadena, Calif.
PROBLEMS OF NUCLEOSYNTHESIS IN THE SUBDWARFS GAMMA PAVONIS AND ZETA (1) RETICULI.
by I. J. Danziger. 20 Jul 65, 10p
Contract AF 49 (638)-1323
Proj. AF-9774
Task 977401
AFOSR-66-1258
Prepared in cooperation with Mount Wilson Observatory, Pasadena, Calif.
Availability: Published in The Astrophysical Journal v143 n2 p527-34 Feb 1966.

Descriptors: (*Stars, *Nuclear reactions), Metals, Spectroscopy, Neutron capture, Distribution, Spectra (Visible+ultraviolet).

Identifiers: Gamma Pavonis, Zeta (1) Reticuli.

The spectra of the southern subdwarfs gamma Pav and zeta (1) Ret were investigated at high dispersion. A curve-of-growth analysis of gamma Pav relative to the Sun showed that elements lighter than Ni are underabundant by a factor of 0.7 in the logarithm. In zeta (1) Ret this factor is 0.4. In both stars the underabundance of carbon was considerably greater than of the other elements, -- 1.3 in the logarithm for gamma Pav and -- 0.8 for zeta (1) Ret. Mn proved to be not more underabundant than Fe. The heavy rare-earth elements in both stars are more underabundant than the Fe group. The present theory of slow neutron capture, producing the s-process elements, is supported by the construction of diagrams of log N-sigma as a function of the atomic weight A. The data for gamma Pav as well as for a series of previously analyzed objects show stellar material with different histories of slow neutron exposure. (Author)

AD-638 866 **Field 3B**
Not available from CFSTI.
Palomar Observatory, Pasadena, Calif.
ABUNDANCES OF ELEMENTS IN SIGMA BOOTIS.
by I. J. Danziger. 9 Aug 65, 4p
Contract AF 49 (638)-1323
Proj. AF-9774
Task 977401
AFOSR-66-1253
Prepared in cooperation with Mount Wilson Observatory, Pasadena, Calif.
Availability: Published in Astrophysical Journal v143 n2 p591-2 Feb 1966.

Descriptors: (*Stars, Spectroscopy), Spectra (Visible+ultraviolet), Hydrogen, Metals, Distribution.

Identifiers: Sigma Bootis.

Results are given for a differential curve-of-growth analysis of the subdwarf sigma Bootis relative to a standard star, Procyon. The mean difference in the logarithm of the metal-to-hydrogen ratio was found to be -0.6. No systematic differences from this deficiency of a factor of four, beyond the errors of the determination were found for individual elements. (Author)

AD-639 013 **Field 3B**
Not available from CFSTI.
Palomar Observatory, Pasadena, Calif.
THE EARLY A STARS. I. ROTATION AND METALLICISM.
by Peter S. Conti. 30 Apr 65, 13p
Contract AF 49 (638)-1323
Proj. AF-9774
Task 977401
AFOSR-66-1255
Prepared in cooperation with Mt. Wilson Observatory, Pasadena, Calif.
Availability: Published in The Astrophysical Journal v142 n4 p1594-1603 15 Nov 1965.

Descriptors: (*Stars, Spectroscopy), Metals, Line spectrum, Rotation, Astrophysics.

The problem of classifying main-sequence stars near type A0 is reviewed. Attention is drawn to a similar difficulty with regard to Am (metallic-line) stars previously found only as early as A5. Recent detail analyses, using model atmospheres of two early A stars, Sirius and 68 Tau, have shown abundance anomalies similar to those in Am stars. Since these stars had been classified as normal, it is suggested that other Am stars of early type can be found by improved methods, one of which is discussed here. The line strength of the strong line of ionized scandium at lambda 4246 relative to the line of ionized strontium at lambda 4215, indicates the presence of an Am star. In normal stars these two lines have the same strength, but in Am stars as well as in Sirius and 68 Tau the scandium line is considerably weaker. This criterion, which is useful for detection of Am stars over a wide range of effective temperature, is clearly discernible only for sharp-line stars and in spectra of relatively high dispersion. A diagram of rotation as a function of B - V color for the brightest stars in the sky indicates many sharp-line stars near type A0, which have formerly been classified as normal. High-dispersion spectra of most of them show that about one-half have anomalous Sc/Sr line strength. It is probable that they are the heretofore hidden analogues of the later-type Am stars and that the metallic-line phenomena extend into the early A stars. (Author)

AD-639 022 **Field 3B**
Not available from CFSTI.
Center for Radiophysics and Space Research, Cornell Univ., Ithaca, N. Y.
ENERGY DENSITY OF STARLIGHT IN THE METAGALAXY.
Revised ed.
by James E. Felten. 12 Nov 65, 5p
Contract AF 49 (638)-1527
Proj. AF-9767
Task 976702
AFOSR-66-1578
Revision of manuscript received 1 Oct 65.
Availability: Published in Astrophysical Journal v144 n1 p241-3 Apr 1966.

Descriptors: (*Stars, *Light), Energy, Density.

The mean metagalactic energy density of starlight emitted by galaxies is estimated semi-empirically from the galactic luminosity function, and errors in a previous theoretical determination are pointed out. The estimate is independent of the astronomical distance scale, weakly dependent on the choice of cosmological model for a wide variety of models, and somewhat more strongly dependent upon the poorly known infrared and ultraviolet emission by galaxies. (Author)

AD-639 024 **Field 3B**
Not available from CFSTI.
Center for Radiophysics and Space Research, Cornell Univ., Ithaca, N. Y.
ON THE ABUNDANCE OF INTERSTELLAR OH.
by T. O. Carroll, and E. E. Salpeter. 2 Dec 65, 6p
Contract AF 49 (638)-1527, Grant NSF-GP-3488
Proj. AF-9767
Task 976702
AFOSR-66-1528
Availability: Published in The Astrophysical Journal v143 n2 p609-12 Feb 1966.

Descriptors: (*Interstellar matter, *Free radicals), Distribution, Hydroxides, Exchange reactions, Hydrogen, Oxygen, Clouds.

Identifiers: Hydroxyl radicals, Interstellar clouds.

It is shown that the interstellar OH abundance is mainly controlled by gas-kinetic-exchange reactions (involving H, H2, and O) during the short cooling periods following cloud-cloud collisions.

AD-639 047 **Field 3B, 18B**
Not available from CFSTI.
Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago, Ill.
ISOTOPIC ABUNDANCES AND ENERGY SPECTRA OF He3 AND He4 ABOVE 40 MeV PER NUCLEON FROM THE GALAXY.
by C. Y. Fan, G. Gloeckler, K. C. Hsieh, and J. A. Simpson. 21 Feb 66, 6p
Contracts AF 49 (638)-1642, NAS5-2990
Proj. AF-9751
Task 975104
AFOSR-66-1504
Grant NsG-179-61
Availability: Published in Physical Review Letters v16 n18 p813-7 May 2 1966.

Descriptors: (*Cosmic rays, *Helium), Stable isotopes, Distribution, Nuclear energy levels, Kinetic energy, Spectroscopy, Interstellar matter.

The abundances of He3 and He4 in the galactic cosmic rays as a function of energy are important for understanding the origin of cosmic rays. Since He3 is a rare isotope in nature, the appearance of He3 in the cosmic rays provides information on the propagation of He4 both in cosmic-ray sources and in interstellar space. Measurements are reported of the primary energy spectra of He3 in the energy range approx. 40 to 110 MeV/nucleon, and of He4 in the energy interval of 13 to 90 MeV/nucleon.

AD-639 051 **Field 3B**
CFSTI Prices: HC$2.00 MF$0.50
Boeing Scientific Research Labs., Seattle, Wash. Geo-Astrophysics Lab.
TRANSIENT RADIATIVE HEAT EXCHANGE AT THE SURFACE OF THE MOON.
by D. F. Winter. Aug 66, 26p D1-82-0559

Descriptors: (*Lunar environment, Heat transfer), Surface properties, Thermal properties, Temperature, Numerical methods and procedures, Partial differential equations, Moon.

The surface of the Moon is characterized as an evacuated particulate medium in which radiative heat exchange between solid surfaces plays a decisive role in determining the transient behavior of the apparent temperature. A simple model is developed which permits quantitative comparisons with lunar surface temperature variations, observed in the 8-12 micron band, both during a lunation and a lunar eclipse. Thermal properties and certain surface characteristics are thereby inferred, including an effective microstructure scale of the order of 0.1 mm. (Author)

AD-639 463 **Field 3B, 4A, 8N, 20N K**
CFSTI Prices: HC$5.00 MF$1.00
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
GEOPHYSICS AND SPACE DATA BULLETIN. VOLUME III, NUMBER I. FIRST QUARTER 1966.
by Anne L. Carrigan, and Norman J. Oliver. 1966, 170p
See also AD-634 824.

Descriptors: (*Geophysics, Experimental data), (*Astronomical data, Reviews), (*Atmosphere, Experimental data), Terrestrial magnetism, Magnetometers, Cosmic rays, Neutrons, Monitors, Ionospheric propagation, High frequency, Riometers, Solar disturbances, Solar flares, Sunspots, Extraterrestrial radio waves, Atmospheric sounding.

Contents: Total field intensity magnetometer; Cosmic ray neutron intensity monitor; Oblique high-frequency propagation; Riometer; Solar Optical Patrol observations; Solar radio emission (Spectral observations, Radio noise measurements); Vertical incidence ionospheric soundings (Absorption loss, Median values).

AD-639 540 **Field 3B, 4A**
Not available from CFSTI.
Lund Univ. (Sweden). Dept. of Physics.
THE COMPOSITION OF THE PRIMARY COSMIC RADIATION AND THE ABUNDANCE OF THE ELEMENTS IN NATURE.
by K. Kristiansson. 2 May 66, 24p
Grant AF-EOAR-35-64
Proj. AF-9751
Task 975104
AFOSR-66-1350
Availability: Published in Arkiv for Fysik v32 n16 p285-305 1965.

Descriptors: (*Cosmic rays, Nuclei), (*Interstellar matter, Nuclei), Protons, Helium, Lithium, Beryllium, Boron, Iron, Oxygen, Silicon, Solar corona, Upper atmosphere, Charged particles, Distribution, Sweden.

The relative abundance of protons, helium nuclei and heavier nuclei is discussed with special emphasis on the composition of the group of heavy nuclei. The amount of interstellar matter traversed by the radiation is estimated to 2.5g/sq cm. The figure is a mean value of two determinations, one based on the amount of Li, Be, and B and the other on the amount of iron relative to the number of nuclei in the interval 17 less or equal to Z less or equal to 25 which are all assumed to be spallation products from Fe+p reactions. The abundances of hydrogen, helium, oxygen, silicon and iron are extrapolated back to the cosmic ray source. Two comparisons are made between the abundances of these elements in the radiation and in nature. The first comparison is performed with the mean universal abundance according to the compilation by L. H. Aller. It is found that the excess of the heavy elements in the radiation is very large and follows approximately a relation R proportional to Z to the 3.5 power for 8 less or equal to Z less or equal to 26. The second comparison is made with the composition of the solar corona reported by S. R. Pottasch. This comparison also shows an over-abundance of the heavy elements. The ratio between the abundance in the radiation and the abundance in the corona follows approximately the relation R approximately Z for particles above the same rigidity. The results are discussed and some conclusions are drawn regarding the injection of the particles into the mechanism of acceleration. (Author)

N66-24019 **Field 3B**
CFSTI Prices HC$1.10 MF$0.50
London Univ. (England).
1965 CONFERENCE ON GENERAL RELATIVITY AND GRAVITATION FINAL SCIENTIFIC REPORT.
by H. Bondi. 13 Dec 65, 5p AD-629098
Contract AF-EOAR-65-21

Descriptors: *Astrophysics, Collapse, *Conference, Effect, Equation, Field, Gravitational, *Gravity, Light, Mechanics, Motion, Quantization, Quantum, *Quantum mechanics, Relativity, *Relativity theory, Theory, Wave.

For abstract, see S 04 13.

N66-24283 **Field 3B**
CFSTI Prices HC$1.00 MF$0.50
Belgian Royal Observatory, Uccle.
SOLAR ACTIVITY IN 1964 - PHOTOSPHERIC AND CHROMOSPHERIC OBSERVATIONS.
L'activite Solaire En 1964 - Observations Photospheriques Et Chromospheriques
by C. Delys, and A. Koeckelenbergh. 1965, 14p
AR-25, PT. 1
In French Its Communications No. 244

Descriptors: Astronomical, *Astronomical observatory, Chromosphere, Filter, Focus, Heliography, Hemisphere, Instrument, North, Number, Optical, *Optical instrument, Photosphere, Power, *Prominence, Solar, South, Sunspot, Telescope, Wolf.

For abstract, see S 04 13.

N66-24326 **Field 3B**
CFSTI Prices HC$5.00 MF$1.00
California Inst. Of Tech., Pasadena.
NEUTRINO ASTROPHYSICS, SUPERMASSIVE STARS, QUASARS, AND EXTRAGALACTIC RADIO SOURCES, AND NUCLEAR ENERGY GENERATION IN SUPERMASSIVE STARS.
by W. A. Fowler. 1965, 170p NASA-CR-74447
Contracts NGR-05-002-028, NONR-220/47/
Presented At The Intern. School Of Phys. "Enrico Fermi", Varenna, Italy, Jul. 1965

Descriptors: *Astrophysics, *Conference, Energy, Generation, Neutrino, Nuclear, Quasi-stellar, *Quasi-stellar radio source (qso), Radio, *Radio source, *Radio star signal, Rotation, Signal, Solar, *Solar energy, Source, Stabilization, *Star, Synchrotron, Telescope.

For abstract, see S 04 13.

N66-24332 **Field 3B**
CFSTI Prices HC$1.00 MF$0.50
Warsaw Univ. (Poland).
REMARKS ON THE MOTION IN GRAVITATIONAL FIELDS OF EXTENDED MASSES.
by B. Kuchowicz. Jan 66, 12p

Descriptors: Antenna, Equation, Field, Fluid, Gravitational, *Gravitational field, Incompressibility, *Incompressible fluid, Mass, Motion, *Neutrino, Particle, Polytrope, Rest, Schwarzschild antenna, Sphere, Star, State, Trajectory.

For abstract, see S 04 13.

N66-24551 **Field 3B**
CFSTI Prices HC$3.00 MF$0.75
Michigan Univ., Ann Arbor.
THE LUNAR ATMOSPHERE SCIENTIFIC REPORT.
by F. Hinton, and D. R. Taeusch. Oct 62, 90p
NASA-CR-71783, KS-1
Contract NASW-133
Its Rept.-03555-11-s

Descriptors: Atmosphere, *Atmosphere model, Atmospheric, *Atmospheric composition, Composition, Data, *Exosphere, Field, Lunar, *Lunar atmosphere, Magnetic, Measurement, Model, Physical, *Physical property, Property, Quiet, Solar, Structure, Sun, Surface, Temperature, Theory, Wind.

For abstract, see S 04 13.

N66-24605 **Field 3B**
CFSTI Prices HC$2.00 MF$0.50
Grumman Aircraft Engineering Corp., Bethpage, N. Y.
CORRELATION OF MECHANICAL AND THERMAL PROPERTIES OF EXTRATERRESTRIAL MATERIALS SECOND QUARTERLY PROGRESS REPORT.
by J. D. Halajian, and J. Reichman. Feb 66, 50p
NASA-CR-71750, RM-309
Contract NAS8-20084

Descriptors: Correlation, Extraterrestrial, Lunar, *Lunar surface, Material, *Mathematical model, Mathematics, Mechanical, *Mechanical property, Model, Powder, Property, Surface, Temperature, Thermal, *Thermal property.

For abstract, see S 04 13.

N66-24802 **Field 3B**
CFSTI Prices HC$2.60 MF$0.50
Liege Univ. (Belgium).
THE LAMBDA 4300 BAND OF CH IN THE SPECTRUM OF COMET IKEYA (1963A) TECHNICAL NOTE NO. 9.
by C. Arpigny. 5 Nov 65, 22p AFCRL-66-111, AD-628813
Contract AF 61/052/-587

Descriptors: Band, Carbon, *Comet, Computer, Energy, *Fluorescence, Hydrogen, Intensity, Level, Line, Molecular, Profile, Program, Rotation, Spectroscopy, Spectrum, State, Steady, *Steady state.

For abstract, see S 04 13.

N66-24893 **Field 3B**
CFSTI Prices HC$3.00 MF$0.50
Osservatorio Astrofisico Di Arcetri, Florence (Italy).
OBSERVATIONS AND MEMOIRES OF THE ASTROPHYSICAL OBSERVATORY OF ARCETRI, 1964.
Osservazioni E Memorie Dell' Osservatorio Astrofisico Di Arcetri, 1964
1965, 72p
In Italian Its Fascicolo No. 80

Descriptors: Alpha, Astrophysics, Equipment, Facula, Flare, Hydrogen, Line, *Moon, Observation, Solar, *Solar flare, Spectrogram, *Spectroheliograph, Spectrum, Sun, *Sunspot.

For abstract, see S 04 13.

N66-24896 **Field 3B**
CFSTI Prices HC$2.00 MF$0.50
Warsaw Univ. (Poland).
NEUTRINOS IN SUPERDENSE MATTER. III - ON PARTIALLY EXTERNAL TRAJECTORIES.
Neutrina W Supergestej Materii. Iii - O Torach Polozonych Czesciowo Na Zewnatrz
by B. Kuchowicz. Jan 66, 26p

Descriptors: Elementary, *Elementary particle, Fluid, Hyperbola, *Hyperbolic orbit, Incompressible, *Incompressible fluid, *Neutrino, Orbit, Particle, Sphere, Trajectory.

For abstract, see S 04 13.

N66-24907 Field 3B
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
A PHOTOMETRIC INVESTIGATION OF THE PRESENCE OF OUTER LAYERS OF VOLCANIC ORIGIN ON THE MOON.
Fotometricheskoye Issledovaniye Voprosa O Nalichii Na Lune Pokrovov Vulkanicheskogo Proiskhozhdeniya
by V. V. Sharonov. May 66, 22p NASA-TT-F-9322
Transl. Into English From Astron. Zh. (Moscow), V. 42, No. 1, 1965 P 136-144

Descriptors: Earth, *Earth surface, Equivalence, Layer, Lunar, *Lunar surface, *Photometry, *Soil, Spectrophotometry, Surface, *Surface layer, Theory, Volcanic, *Volcanic theory.

For abstract, see S 04 13.

N66-24932 Field 3B
CFSTI Prices HC$1.00 MF$0.75
National Aeronautics And Space Administration, Washington, D. C.
LUNAR SURFACE STUDIES A CONTINUING BIBLIOGRAPHY, WITH INDEXES.
Apr 66, 70p NASA-SP-7003/02/

Descriptors: *Abstract, Analysis, Atmosphere, *Bibliography, Characteristics, Equipment, Geology, Instrumentation, Lunar, *Lunar surface, Measurement, Observation, Origin, Physical, Selenology, Surface, Topography.

For abstract, see S 04 13.

N66-25250 Field 3B
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
PHOTOGRAPHIC OBSERVATIONS OF A LOW-DENSITY IRON ARTIFICIAL METEOROID.
by G. A. Harvey. May 66, 28p NASA-TN-D-3420

Descriptors: Artificial, Ballistics, Camera, Charge, Film, *Iron, Low density, Measurement, Meteor, *Meteoroid, Observation, Photograph, *Photographic measurement, Radiation, Shape.

For abstract, see S 04 13.

N66-25371 Field 3B
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
APPARENT LUNAR ACTIVITY - HISTORICAL REVIEW.
by J. M. Burley, and B. M. Middlehurst. Apr 66, 13p NASA-TM-X-55468
Presented At The Nas Symp. On Surface Features Of The Moon, Seattle, 13 Oct. 1965 Submitted For Publication See N66-24927

Descriptors: Action, Activity, Change, Correlation, *Earth, Event, *History, Lunar, *Lunar surface, *Moon, Sunspot, Surface, Temporary, Tidal.

For abstract, see S 04 13.

N66-25686 Field 3B
CFSTI Prices HC$8.35 MF$4.50
National Aeronautics And Space Administration, Washington, D. C.
SPACE RESEARCH - TRANSACTIONS OF THE ALL- UNION CONFERENCE ON SPACE PHYSICS.
by YA. L. Alpert, V. I. Krasovskiy, V. V. Shvarev, and G. A. Skuridin. May 66, 946p NASA-TT-F-389
Transl. Into English Of The Book "Issledovaniya Kosmicheskogo Prostranstva- Trudy Vsesoyuznoy Konferentsii Po Fizike Kosmicheskogo Prostranstva" Moscow, Izd. Nauka, 1965 Conf. Held In Moscow, 10-16 Jun. 1965

Descriptors: *Conference, Corpuscular, Cosmic, Density, Flux, *Ionosphere, *Magnetosphere, Particle, *Particle flux, Physics, Radiation, Ray, Rocket, Satellite, Solar, Space, Stream, *Upper atmosphere.

For abstract, see S 04 14.

N66-26871 Field 3B
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
ENGINEERING MODELS OF THE MARTIAN ATMOSPHERE AND SURFACE.
by D. F. Spencer. 1 Jul 65, 33p NASA-CR-75236, JPL-TM-33-234
Contract NAS7-100

Descriptors: Atmosphere, *Atmosphere model, Design, Landing, *Landing module, Mars (planet), *Mars surface, Module, Planetary, *Planetary landing, Pressure, Profile, Rock, Spacecraft, *Spacecraft design, Surface, Temperature, Velocity, Wind.

For abstract, see S 04 14.

N66-26874 Field 3B
CFSTI Prices HC$3.00 MF$0.75
Little (Arthur D.), Inc., Cambridge, Mass.
FAR INFRARED SPECTRA OF SILICATE MINERALS FOR USE IN REMOTE SENSING OF LUNAR AND PLANETARY SURFACES FINAL REPORT, APR. 1965 - APR. 1966.
by R. V. Allen, J. R. Aronson, A. G. Emslie, and H. G. Mc linden. 15 Apr 66, 76p NASA-CR-75289, C-67323
Contract NAS8-20122

Descriptors: Composition, Infrared, *Infrared spectrum, Instrument, Lunar, *Lunar surface, Material, Planetary, *Planetary surface, Property, Remote, Sensor, *Silicate, Spectrum, Surface.

For abstract, see S 04 14.

N66-34327 Field 3B
CFSTI Prices HC$2.00 MF$0.50
Maryland Univ., College Park.
INTERACTION OF METEOROIDS WITH THE ATMOSPHERE. I - STONY MICROMETEORITES.
by E. J. Oepik, and E. G. Stolarik. Jun 66, 44p NASA-CR-77300
Grant NSG-58-60
Its Tech. Rept.-577

Descriptors: *Ablation, Atmosphere, Deceleration, Dissipation, Drag, Earth, Energy, *Energy dissipation, Evaporation, Interplanetary, Meteorite, *Micrometeorite, Particle, Radiation, Spherical, *Stony meteorite, Terrestrial.

For abstract, see S 04 20.

N66-34635 Field 3B
CFSTI Prices HC$2.00 MF$0.50
Smithsonian Astrophysical Observatory, Cambridge, Mass.
A STUDY OF FLARE STARS.
by L. H. Solomon. 12 May 66, 50p NASA-CR-77289
Grant NSG-87-60
Its Spec. Rept.-210

Descriptors: *Astrophysics, Energy, Flare, Mass, Observation, Optical, Photographic, Spectrum, *Star.

For abstract, see S 04 20.

N66-34678 Field 3B
CFSTI Prices HC$3.00 MF$0.75
Litton Systems, Inc., Minneapolis, Minn.
INVESTIGATION OF SPUTTERING EFFECTS ON THE MOON'S SURFACE ELEVENTH QUARTERLY STATUS REPORT, 25 OCT. 1965 - 24 JAN. 1966.
by C. E. Knight, D. L. Rosenberg, and G. K. Wehner. 8 Mar 66, 92p NASA-CR-77183
Contract NASW-751
Its Rept.-2957

Descriptors: Chemical, Effect, Erosion, Graphite, Lunar, *Lunar probe, Moon, Photoelectric, *Photoelectric photometry, Photograph, *Photograph interpretation, Photometry, Probe, Solar, *Sputtering, Surface, *Surface roughness, Wind.

For abstract, see S 04 20.

N66-34698 Field 3B
CFSTI Prices HC$1.00 MF$0.50
Maryland Univ., College Park.
INTERACTION OF METEORIC BODIES WITH THE TERRESTRIAL ATMOSPHERE.
by E. J. Opik. 27 Jun 66, 21p NASA-CR-77357
Grant NSG-58

Descriptors: Atmosphere, Crater, Drag, Dust, Earth, *Earth atmosphere, Field, Gravitational, *Gravitational field, Heat transfer, Interaction, Mass, Meteor, *Meteorite, Micrometeorite, Velocity.

For abstract, see S 04 20.

N66-34991 Field 3B
CFSTI Prices HC$1.00 MF$0.50
Iit Research Inst., Chicago, Ill.
OPTICAL DETERMINATION OF TEMPERATURE VARIATIONS THROUGHOUT THE SOLAR CORONA DURING THE ECLIPSE OF MAY 30, 1965 FINAL REPORT, 1 FEB. - 31 JUL. 1965.
by G. Henderson. 23 Aug 65, 11p NASA-CR-64824, IITRI-A6122
Contract NASR-65/12/

Descriptors: Corona, Eclipse, Emission, *Fabry-perot interferometer, Interferometer, Line, Measurement, Observation, Optical, *Optical measurement, Solar, *Solar eclipse, Sun, Temperature, Variation.

For abstract, see S 04 20.

N66-35309 Field 3B
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CONDITIONS OF ENCOUNTER BETWEEN DUST AND THE PLANTERS.
by C. W. Mc cracken. 1965, 30p NASA-TM-X-57009
Submitted For Publication

Descriptors: Atmosphere, Dust, Effect, Encounter, Flux, Gravity, Interplanetary, *Interplanetary dust, Measurement, Particle, *Particle flux, Planetary, *Planetary atmosphere, Poynting-robertson effect, Pressure, *Pressure effect, Radiation, Sensor, Solar, *Solar radiation, Spacecraft.

For abstract, see S 04 20.

N66-35318 Field 3B
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Inst. For Space Studies, New York.
THE SEMICONVECTIVE ZONE IN VERY MASSIVE STARS.
by R. Stothers. 1965, 29p NASA-TM-X-56962
Submitted For Publication

Descriptors: *Combustion, *Convection, Core, Evolution, *Hydrogen, Mass, Mixing, Model, Star, Stellar, *Stellar evolution, Zone.

For abstract, see S 04 20.

PB-172 439 **Field 3B**
CFSTI Prices: HC$3.00 MF$0.75
Smithsonian Astrophysical Observatory, Cambridge, Mass.
A STUDY OF FLARE STARS.
Special report.
by Leonard H. Solomon. 12 May 66, 63p SAO-SR-210, 8-65-11
Grant NsG-87-60
Rept. on Research in Space Science.

Descriptors: (*Variable stars, Optical properties), Astrophysics, Astronomical data.

The joint observations by the SAO Baker-Nunn cameras and cooperating radio observatories have shown, on the basis of both statistical and direct evidence, that optical stellar flares are accompanied by bursts of radio energy in the meter wavelengths. From the forms displayed by the initially observed events, it seems possible that the stellar flares are analogues of certain solar events. It also seems reasonably certain that the flare phenomenon is nonthermal in at least one, and probably all, of the cases studied. The program is being continued to allow determination of the similarity between stellar and solar flares. (Author)

AD-639 378 **See Field 22A**

AD-639 570 **See Field 5A**

3C. CELESTIAL MECHANICS

AD-639 424 **Field 3C**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
EFFECT OF THIRD AND FIFTH HARMONICS IN THE DECOMPOSITION OF POWER GRAVITATIONAL FORCE OF A PLANET ON THE MOVEMENT OF ITS SATELLITES.
by A. A. Orlov. 6Jun 66, 16p FTD-TT-65-872 TT-66-62329
Unedited rough draft trans. Moscow Univ. Vestnik. Seriya 3: Fizika, Astronomiya (USSR) v20 n6 p80-8 1964.

Descriptors: (*Planets, *Celestial mechanics), Orbital trajectories, Gravity, Harmonic analysis, Anomalies, Equations of motion, USSR.

Identifiers: Planetary satellites.

Formulas were obtained for the representation of first order relative to q sub 3 and q sub 5 in expressions of coordinates of a satellite of a nonspherical planet. When deriving these formulas, the decomposition into series by degrees of inclination eccentricities of imperturbed orbits was not used. The final result is presented in form of sums of members of two forms: (a) periodic members, depending only upon sinuses and cosinuses of various multiplicity factors, and (b) mixed members, equal to the product of periodic members on an imperturbed actual anomaly v. (Author)

AD-639 479 **Field 3C**
Not available from CFSTI.
Palmer Physical Lab., Princeton Univ., N. J.
EARTH DECELERATION FROM ANCIENT SOLAR ECLIPSES.
Technical rept.
by David R. Curott. 26 Jan 66, 8p
Contract Nonr-1858 (30)
Proj. NR-019-627
Availability: Published in The Astronomical Journal v71 n4 p264-9 May 1966.

Descriptors: (*Earth (Planet), Deceleration), Solar eclipses, Celestial mechanics.

Thirty-two ancient solar eclipse reports have been analyzed to determine the secular decrease in angular velocity of the earth. Seventeen are from Chinese reports in the literature. The computation, based upon Ephemeris Time and recently adopted astronomical constants, is described and the eclipse records discussed. Scatter in the computed mean acceleration indicates that some reports are erroneous or misinterpreted. The values group about-1.7X10 to the minus 10th power/yr (acceleration divided by velocity). Secular trends in the earth acceleration are noted, although ambiguous. (Author)

N66-24664 **Field 3C**
CFSTI Prices HC$2.00 MF$0.50
Smithsonian Astrophysical Observatory, Cambridge, Mass.
RESEARCH IN SPACE SCIENCE. STATISTICAL EVIDENCE OF THE MASSES AND EVOLUTION OF GALAXIES.
by T. L. Page. 10 Dec 65, 44p NASA-CR-71694, SAO SPECIAL REPT.-195
Grant NSG-87

Descriptors: Analysis, Astronomy, *Astrophysics, Cluster, Correlation, Cosmology, Distribution, Evolution, *Galactic evolution, Galaxy, Group, Instability, Kind, Luminosity, *Mass, Matter, Measurement, Motion, Orientation, Pair, Statistical, Velocity.

For abstract, see S 04 13.

N66-26251 **Field 3C**
CFSTI Prices HC$1.00 MF$0.50
Bellcomm, Inc., Washington, D. C.
A NOTE ON A SOLUTION OF THREE BODY PROBLEM.
by R. Y. Pei. 13 Dec 65, 13p NASA-CR-75076

Descriptors: Analysis, *Apollo project, Body, Earth, Geometry, *Libration, Mathematics, Mission, Moon, Point, Problem, Three, *Three-body problem, Triangle.

For abstract, see S 04 14.

N66-26855 **Field 3C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON THE ORIGIN OF STRUCTURE IN THE UNIVERSE.
by E. R. Harrison. May 66, 37p NASA-TM-X-55491, X-640-66-233
Presented At The 14th Intern. Astrophys. Symp. On Gravitational Instability And The Formation Of Stars And Galactic Structures, Liege, Jun. 1966 Submitted For Publication

Descriptors: *Cosmology, Density, Disturbance, Expansion, Gravitation, Gravity, Hypothesis, Inertia, Instability, Linearization, *Origin, Physics, Primary, *Structure, Theory, Thermal, *Universe.

For abstract, see S 04 14.

N66-34697 **Field 3C**
CFSTI Prices HC$3.00 MF$0.50
Republic Aviation Div., Fairchild Hiller Corp., Farmingdale, N. Y.
RESEARCH ON CELESTIAL MECHANICS AND OPTIMIZATION - SECOND-ORDER SOLUTION OF THE POLAR OBLATENESS PROBLEM FINAL REPORT.
by J. J. Morrison. 30 Jun 66, 51p NASA-CR-77352, FHR-2712-6
Contract NAS8-20130

Descriptors: Calculation, Celestial, *Celestial mechanics, Earth, Equation, Harmonics, Mechanics, Motion, *Oblateness, Orbit, Satellite, *Satellite orbit, Zone.

For abstract, see S 04 20.

N66-35017 **Field 3C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
NASA CONFERENCE ON CELESTIAL MECHANICS.
by J. W. Siry. 1963, 26p NASA-TM-X-57856
Proc. Of Conf. Held At The Naval Obs., 10-11 Jan. 1963

Descriptors: Astronomy, Celestial, *Celestial mechanics, Computation, Conference, Geodesy, Gravity, Mathematics, Mechanics, *Nasa program, Orbit, Periodic, Problem, Relativity, Science, Selenology, Space, Technique.

For abstract, see S 04 20.

N66-35181 **Field 3C**
CFSTI Prices HC$2.00 MF$0.50
Auburn Research Foundation, Inc., Ala.
APPLICATION OF THE METHODS OF CELESTIAL MECHANICS TO THE RIGID BODY PROBLEM FINAL REPORT, 1 JUL. 1965 - 1 JUN. 1966.
by J. W. Crenshaw, and P. M. Fitzpatrick. 1 Jun 66, 37p NASA-CR-77498
Contract NAS8-20175

Descriptors: Application, Artificial, Body, Celestial, *Celestial mechanics, Earth, Equation, Euler equation, Gradient, Gravity, Hamilton-jacobi equation, Hamiltonian, Mechanics, Method, Motion, *Motion equation, Perturbation, *Perturbation theory, Poisson equation, Rigid, *Rigid body, Satellite, Theory, Torque.

For abstract, see S 04 20.

N66-35220 **Field 3C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE CLASSICAL "SPHERE-OF-INFLUENCE".
by R. R. Burrows. 29 Jun 66, 36p NASA-TM-X-53485

Descriptors: Approximation, *Approximation method, Celestial, *Celestial mechanics, Classical, Earth, *Earth-moon system, Equation, Fourier analysis, Influence, Iteration, Mechanics, Method, Moon, Motion, *Motion equation, Sphere, System, Technique, Trajectory.

For abstract, see S 04 20.

AD-639 182 **See Field 20J**

N66-25463 **See Field 3A**

4A. ATMOSPHERIC PHYSICS

AD-464 881 **Field 4A, 13B**
CFSTI Price: HC$1.10
Space Systems Div., Inglewood, Calif.
DIFFUSION BIBLIOGRAPHY.
by Donald G. Silva. 15 May 65, 8p

Descriptors: (*Diffusion, Bibliographies), (*Air pollution, Diffusion), Meteorology, Atmosphere, Transport properties.

The emphasis placed on air pollution and diffusion by the Clean Air Act has necessitated a review of technical information published on diffusion and related areas. The author developed this bibliography while preparing a paper entitled 'Propellant Toxicity and Diffusion Prediction Methods'. The bibliography deals primarily with diffusion studies and prediction methods and was not intended to cover the entire field of air pollution. It is hoped that this effort will be useful to Air Force

Bioenvironmental Engineers and Meteorologists who may have a need for this type of information. (Author)

AD-476 584 Field 4A, 17E
CFSTI Prices: HC$2.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
THE MEASUREMENT OF THE EARTH'S INFRA-RED RADIATION FROM A SKYLARK ROCKET.
Technical rept.
by J. K. Moore. Aug 65, 40p TR-65166
N66-14267

Descriptors: (*Infrared radiation, *Earth (Planet)), Sounding rockets, Instrumentation, Infrared scanning, Infrared detectors, Bolometers, Great Britain.

Identifiers: Skylark.

Skylark rockets SL.134 and SL.135 carried experiments to measure the infra-red radiation from the earth in day and night conditions. The experimental infra-red instrumentation is described, and a selection of results is shown. Sufficient measurements were made to assess the radiation gradient at the earth-space horizon, and an infra-red map of the area scan was produced. Due to the failure of Skylark SL.135, 10 sec after launch, data was collected only under night-time conditions; also, the unfortunate motion of SL.134 in space caused a paucity of information in the standard Skylark attitude instrumentation, resulting in poor attitude definition. Thus independent checks of rocket attitude are not available, and although analysis of the records has permitted a determination of the infra-red radiation profile of the earth to be made, accurate positioning of the profile with reference to the earth has proved impossible. (Author)

AD-638 722 Field 4A, 22C
CFSTI Prices: HC$1.00 MF$0.50
Atmospheric Sciences Lab., White Sands Missile Range, N. Mex.
NIKE-APACHE SPEEDBALL II ROUND NO. 87 SN 33 (3 AUGUST 1966).
Meteorological data rept.
by Len E. Carter. Sep 66, 24p DR-72
Task 1V650212A12702

Descriptors: (*Meteorological parameters, Atmospheric sounding), (*Sounding rockets, Ballistics), Tables, Launching, Wind, Meteorology, Rocket trajectories.

Identifiers: Nike-Apache.

Meteorological data gathered for the launching of Nike-Apache Speedball II, Round Number 87, SN 33, are presented for the Physical Sciences Laboratory of New Mexico State University, the U. S. Naval Research Laboratory, and for future ballistic studies. The meteorological data and resulting ballistic data appear in tabular form. (Author)

AD-638 759 Field 4A, 20A
CFSTI Prices: HC$3.00 MF$0.75
Defense Research Lab., Texas Univ., Austin.
REPORT ON RESEARCH TO INVESTIGATE ATMOSPHERIC INFRASOUND.
Annual rept. no. 2, 1 Jul 65-30 Jun 66.
by William C. Rickie, and Donald R. Chick. 13 Jul 66, 66p DRL-A-259
Contract DA-28-043-AMC-00316 (E)
See also AD-613 264.

Descriptors: (*Acoustics, *Atmosphere), Turbulence, Extremely low frequency, Sound, Propagation, Geophysics, Instrumentation.

Identifiers: Infrasound.

The primary content of the report is the presentation of processed infrasonic acoustical data from medium-speed wind, thunderstorms, and several explosion blasts. The data are presented as probability density curves, correlation functions, and power spectra curves. Schematic diagrams and drawings for improvements of previously designed microphones and a new above-ground microphone are included. (Author)

AD-638 905 Field 4A, 12A, 20H
CFSTI Prices: HC$2.00 MF$0.50
RAND Corp., Santa Monica, Calif.
ESTIMATION OF LOCAL ANISOTROPIC SCATTERING PROPERTIES USING MEASUREMENTS OF MULTIPLY SCATTERED RADIATION.
by H. H. Kagiwada, and R. E. Kalaba. Sep 66, 33p RM-5075-PR
Contract AF 49 (638)-1700

Descriptors: (*Transport properties, Scattering), Measurement, Programming (Computers), Numerical analysis, Anisotropy.

The local anisotropic scattering property is estimated on the basis of knowledge of multiple-scattering properties. The phase function is expanded in a series of Legendre polynomials, and the coefficients are determined so as to best explain diffuse reflection measurements. The computational scheme is described and results are given. The FORTRAN program is presented in the Appendix. (Author)

AD-639 115 Field 4A, 4B
CFSTI Prices: HC$2.00 MF$0.50
Atmospheric Sciences Lab., White Sands Missile Range, N. Mex.
THE MEASUREMENT OF TEMPERATURE IN THE STRATOSPHERE AND MESOSPHERE.
by Harold N. Ballard. May 66, 48p
Task 1V650212A127-03
ECOM-5056

Descriptors: (*Sounding rockets, Meteorological instruments), (*Atmospheric temperature, Measurement), (*Stratosphere, Atmospheric temperature), Films, Thermistors, Upper atmosphere, Meteorological parameters.

Careful consideration of the heat transfer equations for a rocket-borne stratospheric temperature sensor in the form of a spherical bead thermistor coupled with an experimental analysis of the physical, thermodynamic, and electrical characteristics of the rocketsonde, indicated that the corrections to the observed thermistor temperatures could be substantially reduced through development of a new rocketsonde. Redesign of the rocketsonde temperature sensor reduced the theoretical temperature correction at 65 km from a value of 36 C for the Delta-I temperature sensing instrument to approximately 5 C for the new design. Temperature data obtained with the new stratospheric temperature sonde STS-1 showed that, after instrument expulsion at 74-km and at rocket nose-cone temperature near 100 C, the thermistor temperatures at and below 60 km were, without correction, in close agreement with those predicted by the U. S. 1962 Standard Atmosphere. (Author)

AD-639 116 Field 4A, 4B
CFSTI Prices: HC$2.00 MF$0.50
Atmospheric Sciences Lab., White Sands Missile Range, N. Mex.
COMPARISON OF ROCKETSONDE AND RADIOSONDE TEMPERATURES AND A VERIFICATION OF COMPUTED ROCKETSONDE PRESSURE AND DENSITY.
by Otto W. Thiele, and Norman J. Beyers. Apr 66, 33p
Task DA-1V650212A127-03
ECOM-5048

Descriptors: (*Sounding rockets, Meteorological parameters), Atmospheric temperature, Measurement, Radiosondes, Performance (Engineering), Barometric pressure, Stratosphere, Density, Hypsometers, Meteorological balloons, Reliability, Atmospheric sounding.

Two diurnal series of rocketsonde temperature measurements complemented by hypsometer-type balloon-borne radiosondes are examined in the overlap region extending from approximately 20 to 32 km altitude. Considering time and space variability, the average temperature difference found in a comparative analysis of corresponding radiosonde and rocketsonde measurements of only 1.26 degrees Celsius (radiosonde colder) through the layer demonstrates exceptionally good agreement particularly since this systematic difference is primarily attributable to excessive infrared cooling of the radiosonde rod thermistor. Since a 'tie-on' pressure from the radiosonde in the overlap region is used to compute pressure and density up to approximately 60 km from the rocketsonde direct temperature measurement, the reliability to be expected from this procedure is also demonstrated. A more recent experiment in which an independent one-point pressure sensor was incorporated with the rocketsonde verified the computed pressure at 55 km. The resultant 1.7 percent pressure difference is within the accuracy limitations of the radiosonde pressure measurement at the 'tie-on' level. (Author)

AD-639 137 Field 4A
Not available from CFSTI.
National Research Council of Canada, Ottawa (Ontario). Div. of Pure Physics.
THE ALOUETTE SATELLITE RESULTS.
by D. C. Rose. 1965, 24p
NRC-8884
Published in unidentified Journal.

Descriptors: (*Scientific satellites, Canada), (*Upper atmosphere, *Charged particles), Radiation measurement systems, Van Allen radiation belt, Electrons, Intensity, Diurnal variations, Aurorae.

Identifiers: Alouette.

Some results obtained from the energetic particle package included in the Alouette satellite are presented. Topics include: average behavior of the outer layer intensity; diurnal behavior of the layer boundary; diurnal variation at different invariant latitudes; electron spikes outside the radiation belt; longer irregular intensity variation.

AD-639 265 Field 4A
Not available from CFSTI.
Arecibo Ionospheric Observatory, Puerto Rico.
RADAR SPECTROGRAPHIC ESTIMATES OF IONIC COMPOSITION AND TEMPERATURES FROM 250 KM TO 1400 KM.
by H. C. Carlson, and W. E. Gordon. 1965, 13p
Contract AF 49 (638)-1156
Proj. AF-2838
AFOSR-66-1580
Availability: Published in Proceedings of the NATO Advanced Study Institute, Finse, Norway p505-14 Apr 1965.

Descriptors: (*Ionosphere, *Electron density), Temperature, Diurnal variations, Puerto Rico.

A semiquantitative estimate is made of ionic composition as a function of altitude above Puerto Rico throughout a winter day over the 250-km to 1400-km altitude range. For this same period and altitude interval, ion temperatures are also determined and limits are placed on the electron temperature. The helium ion layer is found to be thinner and lower than generally expected. The hydrogen ion layer is found to start at a correspondingly lower altitude, is isothermal, and is in thermal equilibrium to within the limits of the measurements. A first-order approximation of no interaction between ionic species is made in view of the scale of the pulse length used to prove the ionosphere. (Author)

AD-639 372 **Field 4A**
Not available from CFSTI.
Stanford Univ., Calif. Stanford Electronics Lab.
SWEEP-FREQUENCY OBLIQUE IONOSPHERIC SOUNDING AT MEDIUM FREQUENCIES.
Technical rept.
by R. B. Fenwick, and G. H. Barry. 19 Oct 65. 7p TR-132, SU-SEL-66-080
Contract Nonr-225 (64), ARPA Order-196-65
Proj. NR-088-019
Availability: Published in IEEE Transactions on Broadcasting, BC-12 n1 p25-7 Jun 1966.

Descriptors: (*Atmospheric sounding, Medium frequency), Ionospheric propagation, Ionosphere, Sweep generators, Radio equipment.

An experimental ionospheric sounder has been constructed for vertical-incidence or oblique sounding in the frequency range 600 kHz to 2 MHz. The equipment employs an FM linear frequency sweep transmission generated by direct synthesis from a frequency standard; an identical sweep is used for demodulation at the receiver. Sounding records, made at night over a 2000-km path, exhibit 10-micro sec resolution and show no interference from broadcast stations. Radiated power ranged from 25 to 250 watts. The advantage of good time delay resolution, together with suppression of interfering signals, makes possible ionospheric sounding of greatly improved quality in the MF range. (Author)

AD-639 476 **Field 4A**
Not available from CFSTI.
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
CORRELATION OF OUTER RADIATION ZONE ELECTRONS (Ee APPROX. ±1MEV) WITH THE SOLAR ACTIVITY CYCLE.
by L. A. Frank, and J. A. Van Allen. 20 Jan 66. 5p
Contract Nonr-1509 (06)
Availability: Published in Journal of Geophysical Research v71 n11 p2697-2700 Jun 1 1966.

Descriptors: (*Van Allen radiation belt, Electrons), (*Solar radiation, Van Allen radiation belt), Upper atmosphere, Solar wind, Periodic variations, Sunspots, Solar disturbances, Scientific satellites.

A comparison of observations with several earth satellites reveals that the inner edge of the outer radiation zone of electron Ee > 1.6 Mev intensities has moved outward from L approx.= 2.2 in mid-1958 to L=3.0 in late 1964. This outward motion in the outer radiation zone occurs during the declining phase of solar activity cycle 19 and strongly suggests a systematic change of the average value of one or more of the solar wind parameters over this time period. (Author)

AD-639 566 **Field 4A**
CFSTI Prices: HC$2.00 MF$0.50
Air Weather Service, Scott AFB, Ill.
REGRESSION EQUATIONS FOR SPECIFYING ATMOSPHERIC DENSITY ABOVE 30 KM FROM OBSERVATIONAL DATA AT RADIOSONDE ALTITUDES.
Technical rept.
by Roderick S. Quiroz, and Gary J. Thompson. Aug 66. 34p TR-187

Descriptors: (*Atmosphere, Density), (*Atmospheric sounding, Equations), Stratosphere, Atmospheric temperature, Barometric pressure, Hydrostatics, Equations of state, Arctic regions, Radiosondes, Meteorological parameters.

Analysis of a small rocket data sample from the Soviet observing site at Heiss Island (81 degrees N) indicated a high correlation between the density of the upper stratosphere and the temperature and pressure at certain altitudes in the lower stratosphere. Strong density-temperature and density-pressure relationships may be anticipated under certain conditions from consideration of the hydrostatic equation and the equation of state, the latter differentiated with respect to height. Large samples of rocket observational data for a northerly and a southerly station were specially processed to yield correlation coefficients for all possible pairs of altitudes between 20 and 60 km. Knowledge of maxima in the vertical profiles of the correlation coefficients then made it possible to construct regression equations with minimum standard error of estimate. It is shown that such equations may be used to predict the density satisfactorily at altitudes up to about 50 km from radiosonde observational data on the thermodynamic state of the lower stratosphere. Incidental to the development of the prediction equations is a discussion of the observed patterns of the intra-level correlation of density with temperature and pressure and the inter-level correlation of density with temperature, pressure, and density, to 80 km. (Author)

AD-639 607 **Field 4A**
CFSTI Prices: HC$5.00 MF$1.00
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
ROCKET MEASUREMENTS OF UPPER ATMOSPHERE DENSITY AND TEMPERATURE OVER FORT CHURCHILL, MANITOBA.
Technical rept.
by R. N. Grenda. Sep 66, 183p UTIAS-117
Grants AF-AFOSR-276-66, NRC-SRA-1

Descriptors: (*Upper atmosphere, Density), (*Atmospheric temperature, High altitude), (*Atmospheric sounding, Arctic regions), Sounding rockets, Barometric pressure, Superaerodynamics, Probes, Meteorological instruments, Canada.

Identifiers: Free-molecular flow.

The report describes a rocket experiment designed to measure density and molecular scale temperature above 100 km by means of a free molecule flow analysis of the data. In addition, pressure, temperature, and density were measured in the lower atmosphere by conventional methods. A theoretical analysis under conditions of continuum and free-molecule flow is included. The desired atmospheric parameters are given in terms of the quantities measured by the rocket-borne instruments. The mechanical design of the payload, and the electronics and electrical system are discussed. The data is reduced and the atmospheric parameters based on the data are presented. The experiment is discussed and modifications are suggested to improve the experiment and obtain better data. (Author)

NBS-TN-337 **Field 4A, 20N, 17B**
CFSTI Prices: HC$0.45 MF$0.50
Environmental Science Services Administration, Boulder, Colo. Inst. for Telecommunication Sciences and Aeronomy.
ADVANCES IN IONOSPHERIC MAPPING BY NUMERICAL METHODS.
by William B. Jones, Ronald P. Graham, and Margo Leftin. 12 May 66, 72p
Also available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.45.

Descriptors: (*Ionosphere, Mapping), (*Meteorological charts, Preparation), Ionospheric propagation, Terrestrial magnetism, Programming (Computers), Numerical methods ; procedures, Atmospheric sounding.

The paper describes recent progress made at ITSA (formerly CRPL) to improve numerical methods for mapping and predicting ionospheric characteristics used in telecommunication. Two major problems are considered: (1) tendency of maps to smooth out physical properties of the ionosphere, particularly at low latitudes and (2) ambiguous values at geographic poles and resulting distortions in immediate surroundings. The second problem is overcome by means of a universal time analysis. Significant improvement is made in the first problem by the use of a modified magnetic dip coordinate. A general description is given of the new procedures for forming numerical maps, including a number of illustrations. Also included are a discussion of the use of numerical maps in the revised form and a Fortran Program for evaluating numerical maps of ionospheric characteristics and for calculating the MUF (ZERO)F2 and MUF (4000)F2. (Author)

N66-24112 **Field 4A**
CFSTI Prices HC$1.00 MF$0.50
California Univ., La Jolla.
EFFECTS OF DIFFERENT FIELD EXPANSIONS ON OMNIDIRECTIONAL PROTON COUNTING RATE DATA.
by S. E. De forest. Dec 65, 18p NASA-CR-74037
Contract NASR-116

Descriptors: Counting, *Counting rate computer, Data, Earth, *Expansion, Field, Longitude, Magnetic, *Magnetic field, Omnidirectional, Proton, *Proton scattering, Rate, Scattering.

For abstract, see S 04 13.

N66-24115 **Field 4A**
CFSTI Prices HC$4.00 MF$1.00
Stanford Research Inst., South Pasadena, Calif.
THERMAL BEHAVIOR OF THE IONOSPHERE AND OBSERVATIONS OF THE EXOSPHERE AND THE IONOSPHERE BY MEANS OF DISTANT EARTH SATELLITES TECHNICAL REPORT NO. 2.
by A. V. Da rosa. Dec 65, 133p NASA-CR-74227, SEL-65-109
Contract NASR-136

Descriptors: Behavior, Concentration, Earth, Electron, *Exosphere, Ionization, Ionospheric, *Ionospheric temperature, Observation, Plasma, Satellite, *Satellite observation, Temperature, Thermodynamics.

For abstract, see S 04 13.

N66-24549 **Field 4A**
CFSTI Prices HC$2.00 MF$0.50
Geophysics Corp. Of America, Bedford, Mass.
SODIUM VAPOR EXPERIMENT QUARTERLY PROGRESS REPORT NO. 2, 1 OCT. - 31 DEC. 1965.
Jan 66, 31p NASA-CR-74582
Contract NAS5-3970

Descriptors: Atmospheric, *Atmospheric turbulence, *Nike-apache rocket, Profile, Rocket, Sounding, Trail, Turbulence, Upper, *Upper atmosphere, *Vapor, Wind, *Wind profile.

For abstract, see S 04 13.

N66-24686 **Field 4A**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
OBSERVATIONS ON PULSATING AURORAS.
by G. R. Cresswell, and T. N. Davis. Nov 65, 22p NASA-TM-X-55445, X-612-65-485
Contract NAS5-9065
Prepared In Part At Alaska Univ.

Descriptors: Activity, Aurora, *Auroral activity, Flame, Image, *Image orthicon tube, Luminosity, Orthicon, Photometer, *Pulse, Synchronous, *Television, Tube, Variation.

For abstract, see S 04 13.

N66-24831 **Field 4A**
CFSTI Prices HC$2.00 MF$0.50
Smithsonian Astrophysical Observatory, Cambridge, Mass.
STATIC DIFFUSION MODELS OF THE UPPER ATMOSPHERE WITH EMPIRICAL TEMPERATURE PROFILES.

by L. G. Jacchia. 1965. 50p NASA-CR-74820
Grant NSG-87-60
Its Contrib. To Astrophys., Vol. 8, No. 9

Descriptors: Atmosphere, Atmospheric, *Atmospheric density, Composition, Density, *Diffusion, Heating, Model, Profile, Static, Table, Temperature, Upper, *Upper atmosphere.

For abstract, see S 04 13.

N66-24953 **Field 4A**
CFSTI Prices HC$2.00 MF$0.50
Stanford Univ., Calif.
LUNAR RADAR MEASUREMENTS OF THE DIURNAL EXCHANGE OF IONIZATION BETWEEN THE IONOSPHERE AND THE MAGNETOSPHERE SCIENTIFIC REPORT NO. 14.
by P. Yoh. Dec 65, 27p NASA-CR-74781, SEL-65-103
Grant NSG-377

Descriptors: Diffusion, Diurnal, Doppler effect, Echo, Electron, Equilibrium, Exchange, Faraday rotation, Flux, Frequency, Ion, Ionization, *Ionosphere, Lunar, *Magnetosphere, Measurement, Radar, *Radar echo, Rotation.

For abstract, see S 04 13.

N66-24969 **Field 4A**
CFSTI Prices HC$1.00 MF$0.50
New York Univ., N. Y.
THEORETICAL STUDY OF ATOMIC AND MOLECULAR GASES AND THEIR REACTIONS IN THE UPPER ATMOSPHERE SEMIANNUAL REPORT, NOV. 1, 1965 - APR. 30, 1966.
by R. C. Sahni. 1966, 13p NASA-CR-74684
Grant NSG-76-60

Descriptors: Atom, *Atomic gas, Carbon monoxide, Chemistry, Constant, Energy, Gas, Ground, Linear, Molecular, *Molecular gas, Orbital, Physical, *Physical chemistry, Potential, Screening, Slater orbital, State.

For abstract, see S 04 13.

N66-25822 **Field 4A**
CFSTI Prices HC$2.00 MF$0.50
France. Ministere De L Air, Paris.
ON THE TOTAL ECLIPSE OF THE SUN OF 15 FEBRUARY 1961. A CONTRIBUTION TO THE ANALYSIS OF ATMOSPHERIC HEAT.
A Propos De L'eclipse Tottale De Soleil Du 15 Fevrier 1961. Essai De Contribution A La Thermique De L'atmosphere
by F. M. Camia. 1965. 41p REPT.-420
1965 41 P Refs In French

Descriptors: Atmospheric, *Atmospheric temperature, Condition, Conduction, Convection, Disturbance, Earth, Eclipse, *France, *Hypothermia, Local, Solar, *Solar eclipse, Temperature, Total, Transparency.

For abstract, see S 04 14.

N66-26656 **Field 4A**
CFSTI Prices HC$4.00 MF$0.75
Stanford Univ., Calif.
INTERPRETATION OF IMPEDANCE PROBE MEASUREMENTS IN THE IONOSPHERE TECHNICAL REPORT NO. 2.
by R. J. Grard. Dec 65, 103p NASA-CR-75122, SEL-65-102
Grant NSG-174-61

Descriptors: Atmosphere, Density, Dipole, Electron, *Electron density, Frequency, Impedance, *Impedance probe, Interpretation, Ionosphere, *Ionospheric temperature, Potential, Probe, Sheath, *Temperature measurement, Upper, *Upper atmosphere.

For abstract, see S 04 14.

N66-26824 **Field 4A**
CFSTI Prices HC$2.00 MF$0.50
Geophysics Corp. Of America, Bedford, Mass.
SODIUM VAPOR EXPERIMENT QUARTERLY PROGRESS REPORT NO. 3, 1 JAN. - 31 MAR. 1966.
Apr 66, 31p NASA-CR-75255
Contract NAS5-3970

Descriptors: Analysis, Atmosphere, Atmospheric, *Atmospheric circulation, Circulation, Dynamics, Motion, Rocket, *Rocket sounding, Sodium, *Sodium vapor, Sounding, Trail, Upper, *Upper atmosphere, Vapor.

For abstract, see S 04 14.

N66-26852 **Field 4A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SOME RESULTS CONCERNING THE PRINCIPAL AIRGLOW LINES AS MEASURED FROM THE OGO-II SATELLITE.
by J. E. Blamont, and E. I. Reed. Apr 66, 33p NASA-TM-X-55488, X-613-66-190

Descriptors: *Airglow, Blue, Emission, Filter, *Geophysical satellite, Geophysics, Line, Night, Oxygen, Photometer, Photon, Satellite, Spectral, *Spectral line, Twilight.

For abstract, see S 04 14.

N66-34626 **Field 4A**
CFSTI Prices HC$4.00 MF$1.00
National Engineering Science Co., Houston, Tex.
INVESTIGATION OF THE RELATION BETWEEN SOLAR VARIATIONS AND WEATHER ON EARTH AS SHOWN BY STUDY OF SIMULTANEOUS DATA FROM THE SUN, MARINER II, NEAR-EARTH SATELLITES AND THE ATMOSPHERE BELOW THE MESOSPHERE.
by J. C. Freeman Jr. and W. H. Portig. Dec 65, 129p NASA-CR-77306
Contract NASW-724

Descriptors: Atmosphere, Atmospheric, *Atmospheric circulation, Circulation, Earth, Earth satellite, Magnetic, *Mariner ii space probe, Mesosphere, *Meteorology, Satellite, Solar, *Solar wind, Storm, *Sun, Tiros satellite, Variation, Weather, Wind.

For abstract, see S 04 20.

N66-34632 **Field 4A**
CFSTI Prices HC$1.00 MF$0.50
Pittsburgh Univ., Pa.
THE PROBLEM OF SODIUM DISTRIBUTION.
by T. M. Donahue. 17 May 66, 15p NASA-CR-77299, SRCC-30
Contract NASR-179, Grant NSG-416
Presented At The Cospar R-2 Symp., Vienna, 17 May 1966

Descriptors: Abundance, Aerosol, Atmosphere, Brightness, Dayglow, Distribution, Diurnal, *Diurnal variation, Layer, Rocket, *Sodium, Sounding, Twilight, Upper, *Upper atmosphere, Variation.

For abstract, see S 04 20.

N66-34662 **Field 4A**
CFSTI Prices HC$2.00 MF$0.50
Colorado State Univ., Fort Collins.
ANISOTROPY OF REFLECTED SOLAR RADIATION FROM VARIOUS SURFACES AS MEASURED WITH AN AIRCRAFT-MOUNTED RADIOMETER.
by V. V. Salomonson. Jun 66, 38p NASA-CR-77215
Contract NASR-147
Its Rept.-2566-1

Descriptors: Aircraft, *Anisotropy, Backscatter, Balance, Heat, Measurement, Mounting, Planetary, Radiation, *Radiometer, Reflection, Solar, *Solar radiation, Surface, Wavelength.

For abstract, see S 04 20.

N66-34673 **Field 4A**
CFSTI Prices HC$2.00 MF$0.50
Avco-Everett Research Lab., Everett, Mass.
UNSTABLE GROWTH OF UNDUCTED WHISTLERS PROPAGATING AT AN ANGLE TO THE GEOMAGNETIC FIELD.
by C. F. Kennel, and R. M. Thorne. May 66, 34p NASA-CR-77341, AVCO-EVERETT RES. REPT.-244
Contracts NASW-837, NONR-2524/00/
Submitted For Publication

Descriptors: Angle, Calculation, Duct, Equator, Field, Geomagnetic, *Geomagnetic field, *Growth, Instability, Mode, Particle, Path, Plane, Propagation, Rate, Ray, Resonant, Unsteady, Wave, *Wave propagation, *Whistler.

For abstract, see S 04 20.

N66-35293 **Field 4A**
CFSTI Prices HC$2.00 MF$0.50
Weapons Research Establishment, Salisbury (Australia).
TEMPERATURE CORRECTIONS TO A BEAD THERMISTOR IN THE UPPER ATMOSPHERE.
by A. D. Hind. May 66, 36p WRE-PAD-121

Descriptors: Atmosphere, Bead, Correction, Dropsonde, Error, Instrument, Measurement, Meteorology, Profile, Temperature, *Temperature profile, *Thermistor, Upper, *Upper atmosphere.

For abstract, see S 04 20.

PB-173 048 **Field 4A, 4B**
CFSTI Prices: HC$1.00 MF$0.50
National Severe Storms Lab., Norman, Okla.
MEASUREMENTS BY AIRCRAFT OF CONDENSED WATER IN GREAT PLAINS THUNDERSTORMS.
Technical note.
by George P. Roys, and Edwin Kessler. Jul 66, 20p
WB-TN-49-NSSP-19

Descriptors: (*Thunderstorms, Moisture), (*Moisture, Thunderstorms), Atmospheric sounding, Aircraft, Airborne, Meteorological instruments.

An aircraft equipped to measure condensed water has obtained records in Oklahoma thunderstorms during 22 traverses above 25,000 feet. The average measured value of the maximum water content in the penetrated storms is 8.4 gm./cu m; this includes the exceptional value 44 gm./cu m. recorded once. The extreme observation is discussed in the light of comments by the aircraft crew, radar observations, and simple theory. While the validity of the extreme observation is not clearly established, theoretical and empirical bases are presented for the logical conception of such high water contents. It seems important to make additional measurements of storm water contents with numerous complementary observations. (Author)

PB-173 049 **Field 4A**
CFSTI Prices: HC$4.60 MF$0.50
Washington Univ., Seattle. Dept. of Atmospheric Sciences.
CONTRIBUTIONS FROM THE CLOUD PHYSICS LABORATORY.
Preliminary rept., 15 Jan-2 Mar 66.
by P. V. Hobbs, W. D. Scott, J. E. Dye, and D. A. Burrows. 2 Mar 66, 42p
Grant NSF-GP-3809
Report on a field research program carried out in the Olympic Mountains of Washington State.

Descriptors: (*Clouds, Physics), Physics laboratories, Water vapor, Carbon dioxide, Sulfur compounds, Dioxides, Supercooling, Nucleation, Ice.

The report commences with a brief description of the physical characteristics of the clouds which occurred at ground level in the neighborhood of the University of Washington's research station in the Olympic Mountains during the period January 15 to March 2, 1966. The most common type of cloud encountered consisted of a mixture of ice crystals and supercooled droplets. Experiments were conducted in artificial clouds to see whether the presence of high concentrations of either carbon dioxide gas or sulphur dioxide gas would effect the time taken to completely glaciate a supercooled cloud. No such effect could be detected. It is suggested, however, that these gases might effect the glaciation-time of natural clouds which contain larger droplets than those present in the artificial clouds. Measurements were made of the electric charge acquired by an ice sphere after it had been whirled through various types of natural cloud. The experiments showed that the ice sphere received considerable electric charge when ice crystals were present in the cloud. (Author)

PB-173 074 **Field 4A**
CFSTI Prices: HC$2.00 MF$0.50
Michigan Univ., Ann Arbor. Dept. of Meteorology and Oceanography.
AN INVESTIGATION OF ATMOSPHERIC TURBULENT TRANSFER PROCESSES OVER WATER.
Final rept.
by Floyd C. Elder. Jun 66, 30p ORA-06882-1-F, Rept. no. 3
Contract Cwb-10964
Proj. ORA-06882

Descriptors: (*Atmospheric motion, Great Lakes), Wind, Atmospheric temperature, Measurement, Meteorological parameters, Tables.

Identifiers: Lake Michigan.

Measurements of wind and temperature profiles were made on the U. S. Lake Survey, Lake Michigan Research Tower during the summer of 1965. The tower was located near Muskegon, Michigan, one mile from shore in fifteen meters water depth. The measurements are described and available data are listed. Selected wind profiles are studied in relation to existing wave characteristics. Roughness length and drag coefficient are calculated for cases when wind speeds were greater than, equal to, and less than the speed of the dominant waves. (Author)

PB-173 091 **Field 4A, 4B**
CFSTI Prices: HC$2.00 MF$0.50
Weather Bureau, Washington, D. C. Techniques Development Lab.
HEMISPHERIC SPECIFICATION OF SEA LEVEL PRESSURE FROM NUMERICAL 700-mb. HEIGHT FORECASTS.
Techniques development lab. rept.
by William H. Klein, and Billy M. Lewis. Jun 66, 36p
WB-TN-47-TDL-5

Descriptors: (*Barometric pressure, Transformations (Mathematics)), High altitude, Low altitude, Pressure, Correlation techniques.

An objective method of translating a map of 700-mb. height into its accompanying chart of sea level pressure is derived from 17 years of daily data at 469 grid points covering the Northern Hemisphere during every other month of the year. The method involves application of the screening technique to derive multiple regression equations which automatically incorporate a prediction of thickness implied by the 700-mb. circulation. On the average, the specification equations explain almost 70 percent of the pressure variance by means of approximately three heights and have a standard error of estimate of about 4 mb. The variation of these and other properties of the equations with geography, latitude, and month is illustrated and discussed. (Author)

AD-638 761 See Field 20C

AD-638 907 See Field 20H

AD-638 908 See Field 20N

AD-638 919 See Field 14B

AD-639 077 See Field 7E

AD-639 378 See Field 22A

AD-639 463 See Field 3B

AD-639 540 See Field 3B

AD-639 541 See Field 20H

NBS-TN-18-26 See Field 17B

PB-172 401 See Field 1D

PB-172 893 See Field 1D

4B. METEOROLOGY

AD-638 757 **Field 4B**
CFSTI Prices: HC$3.00 MF$0.75
National Engineering Science Co., Pasadena, Calif.
ATMOSPHERIC WATER BUDGET OVER TROPICAL AREAS.
Final technical rept.
by W. H. Portig. Aug 66, 102p SN-261
Contract DA-28-043-AMC-01549 (E)
Proj. DA-1V0-14501-B-53A-09
ECOM-01549-F

Descriptors: (*Marine meteorology, *Tropical regions), Atmosphere, Humidity, Caribbean Sea, Mexico Gulf.

Different methods for investigating the water vapor budget over the Caribbean Sea and the Gulf of Mexico are discussed and relevant data sources are listed. From the beginning the study of actual data revealed that the diurnal variation of vapor transport was so large that observations obtained at one fixed hour (or two) daily were not representative for the entire day, and that averages of such data did not represent the average flow. The difference between 12Z and 00Z data is taken as an indication of the diurnal variation and is discussed in detail. The main result is that the diurnal variation is almost the same over large portions of the region irrespective of the geographic conditions near the individual stations, but that a network over the central Pacific Ocean does not show a definite diurnal variation comparable with that over the American waters. Local and spatial differences of the 12Z minus 00Z difference are described. The only data collection accessible to the author containing upper air observations at intervals shorter than twelve hours was analyzed. The result of the analysis shows that diurnal changes are of the same order of magnitude as the mean totals. Hence, trajectories (of water vapor, pollution, fallout, etc.) depend greatly on the time of the day. (Author)

AD-638 874 **Field 4B**
CFSTI Prices: HC$6.00 MF$1.50
Motorola, Inc., Scottsdale, Ariz. Government Electronics Div.
AN ADVANCED METEOROLOGICAL SOUNDING SYSTEM (DESIGN PLAN).
by Elvin F. Krasin, and Kenneth J. Wood. 30 Nov 65, 270p Scientific-1
Contract AF 19(628)-4215
Proj. AF-6670
Task 667002
AFCRL-66-256

Descriptors: (*Meteorological parameters, *Radiosondes), Meteorological instruments, Telemeter systems, Tracking, Sounding rockets, Meteorological balloons, Phase-locked systems.

The purpose was to provide a design plan for an optimum ground based vertical sounding system to obtain accurate meteorological data from balloon or rocket launched radiosondes. The report includes a description of an optimum system, a discussion of the performance requirement for the components, and an analysis of the slant range, altitude, and telemetry errors inherent in the proposed system. The optimum system provides continuous and automatic reception, extraction, reduction, and recording of slant range, telemetry, time, and antenna coordinates. Unambiguous slant range is determined by the time interval between start and stop pulses generated by a pseudo-noise (PN) code transmitted from the ground, turned around by the transponder, and received by the ground station. Telemetry is accommodated by two channels, one continuous and the other time division multiplexed. The commutated channel also provides calibration information for all sensors. The system design uses solid state devices throughout, with reliability and long life emphasized in the ground equipment and simplicity, low cost, and low power drain emphasized in the radiosonde. The system design provides operation at slant ranges up to 300 km with only 35 mw of radiosonde transmitter power and a probable error in slant range of less than 100 feet. The multichannel telemetry is processed with a total system inaccuracy of less than 0.1 percent. The ground antenna design is discussed with the various trade-offs. (Author)

AD-639 114 **Field 4B**
CFSTI Prices: HC$2.00 MF$0.50
Atmospheric Sciences Lab., White Sands Missile Range, N. Mex.
COMPARISON OF NINE PROFILE MODELS FOR THE DIABATIC BOUNDARY LAYER.
by Frank V. Hansen. Jun 66, 42p
Task 1V014501B53A-10
ECOM-5054

Descriptors: (*Mathematical models, *Micrometeorology), Wind, Boundary layer, Numerical analysis, Experimental data.

Nine diabatic models used to describe the shape of the wind and temperature profiles in the surface boundary layer have been compared using factors common to all, such as the gradient Richardson number, the diabatic influence function, and the function psi (z/L'). Numerical integration of the models was accomplished using high-speed digital computer techniques. Experimental data used to evaluate the models were collected at locales of known surface roughness. All models are considered to be valid for a small range of stability but tend to diverge rapidly beyond the transition zone between forced and free convection. Application to data obtained at White Sands Missile Range showed that none of the models was suitable for analysis of data observed under nonstationary conditions. (Author)

AD-639 333 **Field 4B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
EXPERIENCE IN THE ANALYSIS OF A WIND-VELOCITY HODOGRAPH IN THE BOUNDARY LAYER OF THE ATMOSPHERE.
by A. V. Tkachenko, N. M. Volevakha, and N. M. Galadzhii. 21 Jun 66, 16p FTD-TT-65-2022
TT-66-62313
Unedited rough draft trans. of mono. of Voprosy Fizika Atmosfery, Leningrad, 1962 p48-53.

Descriptors: (*Wind, Analysis), Atmosphere, Boundary layer, Atmospheric motion, Velocity, Vector analysis, Graphics, Nomographs, USSR.

Identifiers: Hodographs.

Some preliminary results are presented of the analysis of a wind-velocity hodograph in the boundary layer of the atmosphere in a comparison with data obtained by other methods. (Author)

AD-639 406 **Field 4B, 8B**
CFSTI Prices: HC$1.00 MF$0.50
Cold Regions Research and Engineering Lab., Hanover, N. H.
DEFINING THE COLD REGIONS OF THE NORTHERN HEMISPHERE.
Technical rept.
by Roy E. Bates, and Michael A. Bilello. Jun 66, 17p TR-178
Task DA-IV014501B52A02

Descriptors: (*Climatology, *Northern Hemisphere), Mapping, Snow, Temperature, Air, Permafrost, Arctic regions.

The boundaries of the cold regions of the Northern Hemisphere are located by using parameters of air temperature, snow depth, ice cover, and frozen ground. Each parameter is discussed in detail and references used to develop four Northern Hemisphere cold regions maps are given. In all mountainous areas where few reporting stations exist, specific elevations or ridge lines were used to locate the limits of certain zones. In some areas, for example Greenland and expansive bodies of water, no isopleths were drawn because the parameter was not applicable or because of insufficient information. It is concluded that nearly all of the land mass north of 40 degrees lies within the cold regions, and that nearly half of the land mass in the Northern Hemisphere can be classified as cold regions. (Author)

AD-639 438 **Field 4B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
POSSIBILITIES OF RADAR INVESTIGATION OF CLOUD STRUCTURE.
by A. M. Borovikov, V. V. Kostarev, and I. P. Mazin.7 Jun 66, 15p FTD-TT-65-1859
TT-66-62337
Unedited rough draft trans. of Vsesoyuznoe Nauchnoe Meteorologicheskoe Soveshchanie. Trudy (USSR) v5 p325-32 1963.

Descriptors: (*Clouds, *Meteorological radar), Moisture, Particles, Distribution, Atmospheric precipitation, Radar signals, Absorption, USSR.

It is shown that (1) radar methods of investigating clouds already now permit rich information to be obtained about the distribution of large particles in clouds, which is in itself of great importance, since it allows deeper penetration into the physics of cloud formation processes and percipitation; and that (2) use of the ratiowave absorption phenomenon in clouds open real perspectives of determining water content and cloud boundaries with the aid of a special radar apparatus. (Author)

NBS-M-92 **Field 4B, 20N**
CFSTI Prices: HC$2.75 MF$2.00
National Bureau of Standards, Boulder, Colo.
RADIO METEOROLOGY.
by B. R. Bean, and E. J. Dutton. 1 Mar 66, 441p
NBS Monograph-92
Also available from Superintendent of Documents, GPO, Washington, D. C. 20402, HC: $2.75.

Descriptors: (*Meteorology, Radio signals), (*Atmospheric sounding, Radio signals), (*Radio transmission, Meteorological parameters), Atmosphere, Propagation, Refractive index, Radiosondes, Trophosphere, Climatology, Air mass analysis, Weather forecasting, Attenuation, Refraction, Height finding, Meteorological charts.

Contents: The radio refractive index of air; Measuring the radio refractive index; Tropospheric refraction; N climatology; Synoptic radio meteorology; Transhorizon radio-meteorological parameters; Attenuation of radio waves; Applications of tropospheric refraction and refractive index models; Radio-meteorological charts, graphs, tables, and sample computations.

N66-24334 **Field 4B**
CFSTI Prices HC$17.80 MF$1.00
Norwegian Meteorological Inst., Blindern.
STATISTICAL-DYNAMICAL METEOROLOGICAL PREDICTIONS FINAL REPORT.
by R. Fjortoft. Nov 65, 177p AFCRL-66-113, AD-628820
Contract AF 61/052/-374

Descriptors: Analysis, Atmosphere, *Atmosphere model, Current, Eddy, *Eddy current, Field, Forecasting, Geostrophic, Isotherm, *Meteorology, Model, Prediction, Predictor, Pressure, Statistical, *Statistical analysis, Surface, *Surface pressure, Temperature, *Temperature field, Thermal, *Thermal current, Weather, *Weather forecasting.

For abstract, see S 04 13.

N66-24338 **Field 4B**
CFSTI Prices HC$17.80 MF$1.00
Norwegian Meteorological Inst., Blindern.
A STUDY OF THE PREDICTABILITY OF A 28-VARIABLE ATMOSPHERIC MODEL.
by E. N. Lorenz. Nov 65, 14p
Predictions Nov. 1965 14 P Refs Repr. From Tellus (Stockholm), V. 17, No. 3, 1965 P 321-333 (See N66-24334 13-20)

Descriptors: Atmosphere, *Atmosphere model, Circulation, Current, Eigenvalue, Equation, Forecasting, Meteorology, Model, Pattern, Prediction, Thermal, *Thermal current, Variable, Wavelength, Weather, *Weather forecasting.

For abstract, see S 04 13.

N66-24413 **Field 4B, 14B**
CFSTI Prices HC$2.00 MF$0.50
Deutsche Versuchsanstalt Fuer Luft- Und Raumfahrt, Wessling (West Germany).
THEORETICAL AND EXPERIMENTAL INVESTIGATIONS ON A WINDMILL-TYPE ANEMOMETER.
Theoretische Und Experimentelle Untersuchung-En An Einem Flugelradanemometer
by T. Dahlem, and D. Paffrath. Feb 66, 43p
DLR-FB-66-07
In German, English Summary

Descriptors: Air, *Anemometer, *Calibration, Density, Flow, Measurement, Molecule, *Momentum, Rotation, Theory, Velocity, Wind, *Wind velocity measurement, Windmilling.

For abstract, see S 04 13.

N66-24955 **Field 4B**
CFSTI Prices HC$3.00 MF$0.75
Stanford Research Inst., Menlo Park, Calif.
PROBABILITY DISTRIBUTIONS OF PRECIPITATION- SCATTER INTERFERENCE FINAL REPORT.
by R. H. Blackmer Jr. Apr 66, 74p NASA-CR-74778
Contract NASR-49/23/

Descriptors: Cross section, Distribution, Forecasting, Interference, *Precipitation, Probability, Radiation, Radio, *Radio interference, Scattering, *Scattering cross section, Temperature, Thunderstorm, Weather, *Weather forecasting.

For abstract, see S 04 13.

N66-25372 **Field 4B**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PRELIMINARY RESULTS OF ANEMOMETER COMPARISON TESTS.
by D. W. Camp. 26 Apr 66, 34p NASA-TM-X-53451

Descriptors: *Anemometer, Comparison, Measurement, Profile, Spectrum, Speed, Variation, Velocity, Wind, *Wind velocity measurement.

For abstract, see S 04 13.

N66-26735 **Field 4B, 1B**
CFSTI Prices HC$2.00 MF$0.50
National Aerospace Lab., Tokyo (Japan).
AN EXPERIMENTAL INVESTIGATION ON VERTICAL GUSTS AND THE AIRPLANE RESPONSE.
by K. Ono, and K. Yamane. 1965, 28p NAL-TR-89
In Japanese, English Summary

Descriptors: Acceleration, Air, Aircraft, Atmospheric, *Atmospheric turbulence, Current, Distribution, Flight, *Flight test, Frequency, *Gust, Response, Test, Turbulence, Velocity, Vertical, *Vertical air current, Wave, Wind.

For abstract, see S 04 14.

N66-26768 **Field 4B**
CFSTI Prices HC$1.00 MF$0.50
Technisch Documentatie En Informatie Centrum Voor De Krijgsmacht, The Hague (Netherlands).
REVIEW OF LITERATURE ON METEOROLOGY AND CLIMATOLOGY.
Literatuuroverzicht Meteorologie Klimatologie
16 Apr 66, 25p
In Dutch, English, And German Its Vol. 12, No. M-137

Descriptors: *Abstract, Air, Annotation, *Bibliography, Condensation, Control, *Convection current, Current, Forecasting, Horizontal, *Meteorology, Numerical, Precipitation, Satellite, Vertical, Weather, *Weather forecasting.

For abstract, see S 04 14.

N66-34640 **Field 4B**
CFSTI Prices HC$2.00 MF$0.50
White Sands Missile Range, N. Mex.
AEROBEE NASA 4.95 GS METEOROLOGICAL DATA REPORT, 20 MAY 1966.
by G. L. Dunaway. Jun 66, 34p NASA-CR-77312, DR-34
Jun. 1966 34 P Refs Prepared For Nasa

Descriptors: *Aerobee rocket, Atmospheric, *Ballistics, Balloon, *Balloon sounding, Calculation, Computer, Direction, Impact, *Impact prediction, Launch, Performance, Prediction, Rocket, Sounding, Theoretical, Velocity, Wind.

For abstract, see S 04 20.

N66-34801 **Field 4B**
CFSTI Prices HC$2.00 MF$0.50
White Sands Missile Range, N. Mex.
AEROBEE NASA 4.144 DG (NRL NB 3.165) (18 JULY 1966) METEOROLOGICAL DATA REPORT.
by M. M. Hoidale. Aug 66, 40p NASA-CR-77332, DR-58
Aug. 1966 40 P Refs

Descriptors: *Aerobee rocket, *Ballistics, Balloon, Computer, Humidity, Impact, *Impact prediction, *Meteorological probe, Meteorology, Prediction, Pressure, Probe, Rawinsonde, Rocket, System, *Table, Tempera-

ture, Theodolite, Upper atmosphere, Velocity, Wind.

For abstract, see S 04 20.

N66-34802 Field 4B
CFSTI Prices HC$2.00 MF$0.50
White Sands Missile Range, N. Mex.
AEROBEE NASA 4.159 GG (15 JULY 1966) METEOROLOGICAL DATA REPORT.
by M. M. Hoidale. Aug 66, 33p NASA-CR-77331, DR-56
Aug. 1966 33 P Refs

Descriptors: *Aerobee rocket, *Ballistics, Balloon, Computer, Humidity, Impact, *Impact prediction, *Meteorological probe, Meteorology, Prediction, Pressure, Probe, Rawinsonde, Rocket, System, *Table, Temperature, Theodolite, Upper atmosphere, Velocity, Wind.

For abstract, see S 04 20.

PB-170 372 Field 4B
CFSTI Prices: HC$3.00 MF$0.75
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
LARGE AMPLITUDE LEE WAVES AND CHINOOK WINDS.
by Donald W. Beran. Mar 66, 101p TP-75, WISP-4
Grant WBG-59

Descriptors: (*Air mass analysis, Photointerpretation), (*Winds, Air mass analysis), (*Photointerpretation, Air mass analysis), Weather forecasting, Atmospheric temperature, Mountains, Barometric pressure, Atmospheric motion, Moisture, Meteorological satellites.

Identifiers: WISP project.

Four types of chinooks are described: (1) warming of parcel due to subsidence, (2) warming due to latent heat gain on windward side of mountains, (3) wave action at interface of cold surface air and warmer air aloft, and (4) nocturnal chinooks. The suggestion made by Scorer and Klieforth (Quart. J. Royal Met. Soc. v85 p131 1959) that large amplitude lee waves could be a possible driving mechanism for chinook or foehn winds is investigated for two cases which occurred in the Rocky Mountains. It is shown that there is a relation between the stability of the surface inversion layer on the windward side of the mountains, and the area under the influence of chinook winds on the leeward side. Flow patterns at 250 mb and 700 mb were analyzed along with the moisture flux at 700 mb. The analyses of wind field, mass divergence, vorticity, and divergence of moisture were compared with TIROS photographs over the mountains. (Author)

PB-170 376 Field 4B
CFSTI Prices: HC$3.00 MF$0.75
Weather Bureau, Washington, D. C.
CATALOG OF 5-DAY MEAN 700-MB. HEIGHT ANOMALY CENTERS 1947-1963 AND SUGGESTED APPLICATIONS.
by James F. O'Connor. Apr 66, 65p WB-TN-40-NMC-37

Descriptors: (*Air mass analysis, Catalogs), (*Meteorological parameters, Anomalies), Atmospheric motion, Tables, Weather forecasting, Information retrieval.

All significant centers of height departures from normal throughout the Northern Hemisphere north of 20 degrees N for two 5-day periods each week from 1947 to 1963 are presented in catalog form. The locations of centers are grouped according to the nearest 10 degrees of latitude and longitude, and by sign and season. The sign, date, and intensity identify centers within each group. A discussion of uses and plans for group processing are included. (Author)

PB-170 628 Field 4B, 17I
CFSTI Prices: HC$1.00 MF$0.50
Weather Bureau, Washington, D. C.
RADAR AND THE FORECASTER.
Technical note.
by Patrick Hughes. Feb 66, 19p TN-34-RADAR-2

Descriptors: (*Weather forecasting, Meteorological radar), (*Meteorological radar, Reviews), Airport radar systems, Operation, Storms, Effectiveness.

A non-technical discussion and evaluation of the overall role of radar in a station program, with emphasis on forecasting applications, the paper is based on more than 5 years experience with the WSR-57 radar at Washington National Airport. (Author)

PB-170 689 Field 4B
CFSTI Prices: HC$3.00 MF$0.75
California Univ., Los Angeles. Dept. of Meteorology.
NUMERICAL STUDIES OF ORGANIZED CIRCULATION IN SUBTROPICAL LATITUDES.
Final rept.
by T. N. Krishnamurti. Apr 66, 92p
Grant Cwb-10877

Descriptors: (*Atmospheric motion, Mathematical models), (*Tropical regions, Atmospheric motion), Atmospheric temperature, Moisture, Wind, Weather forecasting, Equations.

The project was devoted to an examination of the motion, temperature and the moisture field in two tropical weather systems: (1) an easterly wave of the lower troposphere in the summer season beneath an upper tropospheric cold core low, and (2) a monsoon circulation over the Asian region during summer. Numerical aspects of the study delt with an evaluation of the vertical motions and the nongeostrophic winds from solution of a balanced model. Some preliminary attempts were made to carry the information of the balanced model into a multilevel primitive equation prediction model for the easterly wave in the Carribean. (Author)

PB-170 690 Field 4B
CFSTI Prices: HC$4.00 MF$1.00
Hebrew Univ., Jerusalem (Israel). Dept. of Meteorology.
METEOROLOGICAL SATELLITE DATA, A REPORT OF STUDIES.
Rept. for the 2nd year of the project, Mar 65-Feb 66.
by J. Neumann. 1966, 137p
Contract Cwb-11055

Descriptors: (*Meteorological satellites, Photointerpretation), (*Meteorological parameters, Meteorological satellites), Wind, Cloud cover, Atmospheric motion, Middle East, Jet streams (Meteorology), Atmospheric temperature, Aerial photographs, Meteorological charts, Israel.

Identifiers: TIROS.

Contents: Comparison between the W field at the 500 mb surface and the large scale cloud distribution as observed by TIROS satellites, by Z. Alperson and A. Zangwill; Some cases of lee waves in the Middle East as seen by TIROS satellites, by A. Cohen, E. Doron and S. Wiener; Some cases of jet streams in the Middle East as seen from TIROS satellite photographs, by M. W. Levi; The use of TIROS jet photographs for correcting initial data for numerical forecasting, by Y. L. Tokatly; A trial of fitting temperature profiles with the help of TIROS radiation measurements, by Y. L. Tokatly; A computer program for the gridding of TIROS photographs including distortion modification, by A. Cohen, E. Doron and E. M. Leibowitz.

PB-170 692 Field 4B
CFSTI Prices: HC$3.00 MF$0.75
Florida State Univ., Tallahassee. Dept. of Meteorology.
SATELLITE STUDY, TROPICAL NORTH ATLANTIC, 1963. PART I. SURFACE WIND ANALYSES, SEPTEMBER 1 - SEPTEMBER 30.
by C. I. Aspliden, G. A. Dean, and H. Landers.
Mar 66, 96p Research rept. 66-2
Grant WBG-58
See also PB-169 056.

Descriptors: (*Atlantic Ocean, *Meteorology), (*Wind, Meteorological satellites), Cyclones, Air mass analysis, Cloud cover, Analysis, Photointerpretation, Meteorological charts.

Identifiers: TIROS.

Surface wind analyses and cyclone tract charts were accomplished initially without any reference to satellite pictorial data. Then, they were checked carefully with mosaics and nephanalyses of all of the TIROS VI and TIROS VII passes through the region during the period. There was an average of two to three passes per day. No existing cyclones were eliminated nor new ones inserted as a result of the checking. It was noted that the cyclones generally appeared within predominant cloud masses, or on the southern or northern edge of such masses and that the asymptotes of confluence frequently seemed to be associated with cloud lines or bands.

PB-170 892 Field 4B
CFSTI Prices: HC$3.00 MF$0.75
Pennsylvania State Univ., University Park. Dept. of Meteorology.
ESTIMATION OF THE 90m WIND FROM LOW-LEVEL OBSERVATIONS.
Final rept., 15 Sep 64-31 Mar 66.
by Steven R. Hanna, and Hans A. Panofsky. 31 Mar 66, 66p
Contract Cwb-10951

Descriptors: (*Wind, Velocity), Meteorological data.

Hourly averages of temperature and wind were collected from a 90m tower at Tyson's corner, Virginia. From these observations, an empirical method was developed for the estimation of the wind at 90m from wind and temperature at 30m and below. The method accounted for about 80% of the variance of the 90m - 30m wind ratio. Monin and Obukhov similarity theory was modified by the inclusion of the effects of Coriolis and pressure gradient forces in order to arrive at a theoretical equivalent to the empirical estimation process. Agreement between observations and theory was quite good. Due to the varying roughness characteristics of the terrain around the tower a dependence of roughness length on wind direction could be demonstrated; further, roughness decreases significantly when the ground was snow-covered. The roughness length during the summer varied from 50 cm for SW winds to 10 cm for NW winds; during the winter the value for NW winds decreased to 1 cm over open-ground and .01 cm over snow-covered ground. The theoretical and practical relationships were valid for unstable, neutral, and slightly stable stratification. In very stable air, no successful method was found for the estimation of the 90m wind. An attempt to use the geostrophic wind as a predictor was not successful. (Author)

PB-170 974 Field 4B
CFSTI Prices: HC$3.00 MF$0.75
United Aircraft Corporate Systems Center, Farmington, Conn.
REPORT ON ANALYSIS AND EVALUATION OF NAFEC MESONET SYSTEM.
4 Jun 64, 90p SCR-196
Contract Cwb-10827

Descriptors: (*Weather stations, Networks), (*Meteorological instruments, Automatic), Probes, Data transmission systems, Programming (Computers), Digital systems, Analog systems, Analysis, Effectiveness.

Identifiers: Mesonet.

PB-172 854 **Field 4B**
CFSTI Prices: HC$3.00 MF$0.75
Little (Arthur D.), Inc., Cambridge, Mass.
THE APPLICATION OF SYSTEM ANALYSIS TO LONG-RANGE PLANNING AT THE WEATHER BUREAU - A FEASIBILITY STUDY.
25 Jun 63, 59p C-65340
Contract Cwb-10555

Descriptors: (*Meteorology, *Management planning), Meteorological parameters, Systems engineering, Feasibility studies, Weather forecasting, Information retrieval.

The study is concerned with determining the extent to which current techniques of systems analysis can contribute to improving the planning activities of the Weather Bureau. It is essentially a feasibility study, in which are considered the possible methods of approach, the potential end values, and the likely problems to be encountered when undertaking a broad systems analysis of the long-range plans of the Weather Bureau. The goal of these long-range plans is the improvement and redesign of the existing meteorological system to incorporate technological advances in weather observation, data handling, and presentation of weather information to users.

PB-173 018 **Field 4B**
CFSTI Prices: HC$4.00 MF$1.00
Allied Research Associates, Inc., Concord, Mass.
Aracon Geophysics Div.
TOWARD THE DYNAMICAL INTERPRETATION OF SATELLITE-OBSERVED EXTRATROPICAL VORTICAL CLOUD PATTERNS.
Final rept.
by C. William Rogers, and Paul E. Sherr. May 66, 135p
Contract Cwb-11123

Descriptors: (*Clouds, Meteorological parameters), Cyclones, Atmospheric motion, Meteorological satellites, Storms.

The report describes further studies of extratropical cyclonic cloud patterns using satellite television pictures, satellite IR data, and conventional meteorological data. The results support a hypothesis, proposed by the authors in 1965, to explain the generation of satellite observed vortical cloud patterns. This hypothesis specified the relative roles of vertical and horizontal motion in producing the satellite-observed vortical cloud patterns associated with developing, low-level baroclinic cyclones. During the earlier stages of storm development, the observed cloud patterns result principally from rather characteristic vertical motion patterns. In later stages, horizontal advection of the previously formed cloud masses becomes progressively more important in shaping the cloud field, especially as closed circulations develop. Vertical motion patterns may, however, continue to modulate the basically advective patterns. Based on results of these additional studies, it has now been possible to specify the relative roles of vertical and horizontal motion for such other cyclonic systems as upper-level baroclinic cyclones and full latitude troughs. Case studies and models of vortical cloud pattern generation are presented for: (1) the short wave induced low-level baroclinic cyclone, (2) the frontal wave initiated low-level baroclinic cyclone, (3) the upper-level baroclinic cyclonic system, and (4) the full latitude mid-tropospheric trough. (Author)

PB-173 072 **Field 4B**
CFSTI Prices: HC$2.00 MF$0.50
Department of Commerce, Washington, D. C. Office of Federal Coordinator for Meteorological Services and Supporting Research.
THE FEDERAL PLAN FOR METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH FISCAL YEAR 1967.
1966, 46p

Descriptors: (*Weather forecasting, Research program administration), Meteorology, Scientific research, Federal budgets, United States Government.

PB-173 073 **Field 4B, 17B, 17I**
CFSTI Prices: HC$3.60 MF$0.75
Travelers Research Center, Inc., Hartford, Conn.
A COMPARISON OF RADAR CODES FOR MULTI-STATION SYNOPTIC OBSERVATION.
by John A. Russo Jr. Jul 61, 61p TRC-M-7, Technical memo TM-3
Contract FAA/BRD-363

Descriptors: (*Meteorological radar, Data transmission systems), (*Data transmission systems, Meteorological radar), (*Weather communications, Meteorological radar), Radar signals, Coding.

Five radar codes are compared and their merits (for synoptic scale usage) evaluated with regard to various criteria including (1) amount and precision of information the code is able to convey, (2) minimum transmission and data handling time, and (3) minimum cost consistent with information requirements. Results indicate that a digitized format code is required if radar information is to be treated objectively. Three alternative radar coding techniques are suggested and arguments are presented in favor of a particular digitized code developed during this study. (Author)

AD-481 077 **See Field 22C**

AD-638 754 **See Field 17H**

AD-638 835 **See Field 12A**

AD-639 115 **See Field 4A**

AD-639 116 **See Field 4A**

AD-639 462 **See Field 8L**

PB-169 120 **See Field 1E**

PB-170 395 **See Field 17B**

PB-170 806 **See Field 17I**

PB-170 832 **See Field 17I**

PB-170 976 **See Field 1B**

PB-172 872 **See Field 9F**

PB-173 048 **See Field 4A**

PB-173 091 **See Field 4A**

5A. ADMINISTRATION AND MANAGEMENT

AD-638 850 **Field 5A, 12B**
CFSTI Prices: HC$4.00 MF$1.00
Western Management Science Inst., Univ. of California, Los Angeles.
OPTIMAL INVESTMENT AND CONSUMPTION STRATEGIES FOR A CLASS OF UTILITY FUNCTIONS.
Doctoral thesis.
by Niles Hemming Hakansson. Jun 66, 143p
WMSI Working Paper-101
Contract Nonr-233 (75)
Proj. NR-047-041

Descriptors: (*Optimization, *Management engineering), (*Decision making, Management engineering), Economics, Model theory, Dynamic programming.

Identifiers: Theses, Utility functions.

The research formalizes Irving Fisher's model of the individual under risk, and represents at the same time a generalization of Phelphs' model of personal saving (Econometrica, October 1962). The objective of the individual is postulated to be the maximization of expected utility from consumption over time where the horizon is arbitrarily distant. The individual's resources consist of an initial capital position (which may be negative) and a non-capital income stream which is known with certainty but which may possess any time-shape. The individual faces both financial opportunities (borrowing and lending) and an arbitrary number of productive investment opportunities. The interest rate is presumed to be known and invariant over time; the case when the borrowing rate exceeds the lending rate is examined for a specialized model. The returns from the productive opportunities are assumed to be random variables, whose probability distributions may differ from period to period. The basic (Fisherian) characteristic of the approach taken is that the portfolio composition decision, the financing decision, and the consumption decision are all analyzed simultaneously in one model. The vehicle of analysis is discrete-time dynamic programming.

AD-638 851 **Field 5A, 12A**
CFSTI Prices: HC$2.00 MF$0.50
Western Management Science Inst., Univ. of California, Los Angeles.
DESCRIPTIVE AND NORMATIVE IMPLICATIONS OF THE DECISION THEORY POSTULATES. A SUMMARY OF EXPERIMENTAL RESULTS WITH BUSINESS EXECUTIVES.
by Kenneth R. MacCrimmon. Apr 66, 39p
WMSI Working Paper-102
Contract Nonr-233 (75)
Proj. NR-047-041
Prepared in cooperation with Carnegie Inst. of Tech., Pittsburgh, Pa., Working Paper-21R. Prepared for presentation at International Economic Association Conference on 'Risk and Uncertainty', Smolenice Castle (Czechoslovakia), 30 Mar-5 Apr 66.

Descriptors: (*Decision making, *Uncertainty), (*Decision theory, *Management engineering), Experimental data, Mathematical logic.

The study deals with decision making under uncertainty, and more specifically with a set of postulates (based on the concepts of utility and personal probability) for consistent decision making. It explores the degree to which these postulates are good descriptions of actual behavior and the degree to which they seem to be good norms. Experiments in the form of decision problems based on each of the postulates were given to experienced business executives. In addition to obtaining basic responses to these problems, a systematic follow-up was made both in written and later in oral form in order to probe the normative implications of the postulates. It is concluded, based on the basic responses, that the decision making theory under study is not a very good description. However--and this is the important point--the subjects tend to regard most of the deviations from the theory as mistakes and if given the opportunity will correct them. This suggests the importance of the postulates in training decision makers in both how to structure decision problems and also how to police their own decisions. (Author)

AD-638 952 **Field 5A, 5C, 12B**
Not available from CFSTI.
Western Management Science Inst., Univ. of California, Los Angeles.
A UTILITY FUNCTION DERIVED FROM A SURVIVAL GAME.
Revised ed.
by Karl Borch. Nov 65, 13p WMSI Reprint-34
Proj. NR-047-041
Revision of manuscript received May 65. Research supported in part by Ford Foundation.
Availability: Published in Management Science v12 n8 pB-287-95 Apr 1966.

Descriptors: (*Economics, Game theory), (*Game theory, Decision making), (*Decision making, Uncertainty), Commerce, Dynamic programming, Management engineering.

Identifiers: Utility functions, Survival games.

The starting point of the paper is a firm engaged in a risky business. It is assumed that the firm's gain in each operating period is a stochastic variable. It is further assumed that these stochastic variables are independent and identically distributed. If the capital of the firm becomes negative, the firm is ruined, and must go out of business. The optimal dividend policy is defined as the policy which will maximize the expected discounted value of the dividends paid before ruin occurs. It is then shown that the solution of the dividend problem gives the utility function, which will govern the firm's decisions under uncertainty. From this result it appears that a number of decisions which seem irrational when studied in isolation, become perfectly rational when analysed in their proper dynamic setting. (Author)

AD-638 956 **Field 5A, 12B, 13H**
Not available from CFSTI.
Western Management Science Inst., Univ. of California, Los Angeles.
LABOR ASSIGNMENT AS A DYNAMIC CONTROL PROBLEM.
by Rosser T. Nelson. 30 Aug 65, 12p WMSI-Reprint-33
Contract Nonr-233 (75)
Proj. 047-003
Availability: Published in Operations Research v14 n3 p369-76 May-Jun 1966.

Descriptors: (*Production control, Optimization), Labor, Scheduling, Queueing theory, Management engineering.

A problem of labor assignment in a labor and machine limited production system is formulated as a dynamic control problem. The criterion function employed is total in-process inventory cost over a time period (O, T). The Pontryagin maximum principle is applied to obtain necessary and sufficient conditions for the optimal control. Specifications defining the admissible set of control vectors leads directly to the constrained optimal solution that is found to be a time-dependent control determined by both the queue lengths and transitions among production centers. Some examples are given to illustrate the nature of the resulting priority policies in tandem and network type systems. A number of limiting assumptions and omissions that facilitated analytical resolution of the problem are discussed to suggest challenging possibilities for extensions of the model. (Author)

AD-638 992 **Field 5A, 12B**
Not available from CFSTI.
RAND Corp., Santa Monica, Calif.
SEPARABLE MARKOVIAN DECISION PROBLEMS.
by Eric V. Denardo. Sep 66, 15p P-3448
Availability: Published in Management Service 12p.

Descriptors: (*Decision making, Optimization), Mathematical programming, Decision theory.

The special structure of a class of Markovian decision problems is exploited to yield equivalent, but simpler Markovian decision problems. For certain pairs consisting of state i and decision k the immediate cost c sub i (k) is assumed to separate (c sub i (k) = a sub i + b sub k) into a component which depends on the state and one depending on the decision. The associated transition probabilities depend only on the decision (p sub ij (k) = p sub j (k)), a decision which is available from more than one state. Implications are drawn for the finite stage, the discounted, and the averaging versions of the model. (Author)

AD-639 437 **Field 5A, 9B**
CFSTI Prices: HC$2.00 MF$0.50
David Taylor Model Basin, Washington, D. C.
LARC PROGRAM FOR GENERATING MANAGEMENT REPORTS ON LABORATORY PROGRAM SUMMARIES.
by Sarah E. Kenady, and Charles G. McGuigan. Aug 66, 47p Rept. no. 2245
Proj. S-R003-03-01
Task 10919

Descriptors: (*Programming (Computers), *Management engineering), Naval operations, Control.

Identifiers: LARC.

The report describes computer routines for generating reports based on laboratory program summaries and quarterly progress reports at the David Taylor Model Basin. (Author)

AD-639 570 **Field 5A, 9B, 17B, 17I K**
CFSTI Prices: HC$2.00 MF$0.50
Lincoln Lab., Mass. Inst. of Tech., Lexington.
GENERAL RESEARCH.
Quarterly technical summary rept. 1 May-31 Jul 66.
by F. G. Frick, and V. A. Nedzel. 15 Aug 66, 48p
Contract AF 19 (628)-5167
Proj. AF-649L
ESD-TR-66-401
See also AD-634 819.

Descriptors: (*Data processing systems, Scientific research), (*Radar, Scientific research), (*Engineering, Scientific research), (*Solid state physics, Scientific research), Digital computers, Computer storage devices, Psychology, Control systems, Space surveillance systems, Radio astronomy, Planets, Microwave equipment, Lasers, Semiconductor devices, Radar antennas.

This Quarterly Technical Summary consolidates the reports of Division 2 (Data Systems), Division 3 (Radio Physics), Division 4 (Radar), Division 7 (Engineering), and Division 8 (Solid State) on the General Research Program at Lincoln Laboratory. (Author)

N66-24117 **Field 5A**
CFSTI Prices HC$3.00 MF$0.50
George Washington Univ., Washington, D. C.
CONTRACTOR DECISION MAKING AND INCENTIVE FEE CONTRACTS.
by C. E. Bradley, and C. Mc cuistion. 22 Dec 65, 65p NASA-CR-74217
Grant NSG-425

Descriptors: *Contract, Control, Cost, *Cost estimate, Decision, *Decision theory, Economics, Estimate, Industry, Performance, Space, System, Theory, Weapon, *Weapons industry.

For abstract, see S 04 13.

AD-638 852 **See Field 12B**

AD-638 971 **See Field 14B**

AD-639 273 **See Field 8J**

AD-639 601 **See Field 15E**

NBS-PUB-279 **See Field 14B**

PB-173 252 **See Field 15E**

5B. DOCUMENTATION AND INFORMATION TECHNOLOGY

AD-638 751 **Field 5B**
CFSTI Prices: HC$1.00 MF$0.50
Marquardt Corp., Van Nuys, Calif.
PYRODYNAMICS.
by Gilbert S. Bahn. 1966, 13p
Rept. on A Documentation - Oriented Special Technical Journal.

Descriptors: (*Periodicals, Thermodynamics), Reports, Reviews, Bibliographies.

AD-638 928 **Field 5B**
CFSTI Prices: HC$4.00 MF$0.75
Military Academy, West Point, N. Y.
MILITARY LIBRARIANS WORKSHOP (9th) HELD AT THE UNITED STATES MILITARY ACADEMY, WEST POINT, NEW YORK, 3-5 NOVEMBER 1965.
Conference proceedings.
Nov 65, 118p
See also AD-632 300.

Descriptors: (*Libraries, Military organizations), Symposia, Department of Defense, Data processing systems, Periodicals, Microfilm, Navy, Army, Documentation, Information retrieval.

Identifiers: Thesauri, Information systems.

NBS-MP-274 **Field 5B**
CFSTI Prices: HC$0.50 MF$0.75
National Bureau of Standards, Washington, D. C.
PERIODICALS AND SERIALS RECEIVED IN THE LIBRARY OF THE NATIONAL BUREAU OF STANDARDS AS OF OCTOBER 1965.
by Natalie J. Hopper. 1 Jul 66, 91p
Availability: Available from Superintendent of Documents, GPO, Washington, D. C. 20402, HC$0.50 as C 13.10:274.

Descriptors: (*Libraries, Periodicals), (*Periodicals, Libraries), Bibliographies, United States Government.

Identifiers: Serials, National Bureau of Standards.

The publication (which is a revision of the NBS Monograph 57) lists alphabetically the periodicals and serials, both American and foreign, that are currently being received in the Library of the National Bureau of Standards. Approximately 2,400 titles are cited, together with call numbers indicating the location of bound volumes in the Library. Although this information was compiled primarily for the use of the Bureau's scientific staff, it is also of value to libraries, scientific and technical organizations, and research workers. (Author)

NBS-TN-289 **Field 5B**
CFSTI Prices: HC$0.50 MF$0.75
National Bureau of Standards, Washington, D. C. Office of Standard Reference Data.
NATIONAL STANDARD REFERENCE DATA SYSTEM APRIL 1966.
Status rept.
by Edward L. Brady. 1 Jun 66, 86p
Also available from the Superintendent of Documents, GPO, Washington, D. C. 20402, HC$0.50, as C 13.46:289.

Descriptors: (*Scientific research, Data), (*Data, Scientific research), Nuclear physics, Atomic properties, Molecular properties, Solid state physics, Thermodynamics, Transport properties, Reaction kinetics, Colloids, Surface properties, Mechanical properties, Documentation, Standardization.

Identifiers: National standard reference data system.

The report summarizes the status of the activities of the NBS Office of Standard Reference Data as of March, 1966. It provides a detailed review of the data compilation activities within the seven broad categories within the technical scope of the

program: (1) nuclear data, (2) atomic data and molecular data, (3) solid state data, (4) thermodynamic and transport data, (5) chemical kinetics, (6) colloid and surface properties, and (7) mechanical properties. Plans for an information services program are also outlined. Certain problem areas are identified. The appendix includes a listing of properties with which the program is concerned and a listing of the advisory panels of the Office of Standard Reference Data. (Author)

NBS-TN-290 **Field 5B**
CFSTI Prices: HC$0.25 MF$0.50
National Bureau of Standards, Washington, D. C. Office of Standard Reference Data.
INFORMATION HANDLING IN THE NATIONAL STANDARD REFERENCE DATA SYSTEM.
Technical note.
by Franz L. Alt. 1 Jul 66, 30p
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.25.

Descriptors: (*Information retrieval, Data storage systems), Standards, Documentation.

Identifiers: National standard reference data system.

A preliminary plan is presented for the selection, acquisition, intellectual organization, and storage of the information which will underlie the Information Services Operation of the National Standard Reference Data System, as well as for methods of locating desired information items in storage, retrieving, and displaying or communicating them. Questions of the use of computers for these purposes are discussed, including selection of equipment, arrangement of digital storage, input format, remote access, and the economics of choosing certain functions of the system for mechanization. Also, an interim system, based on conventional and, in the main, manually operated files, is described. (Author)

N66-24905 **Field 5B, 9B**
CFSTI Prices HC$3.00 MF$0.50
Weapons Research Establishment, Salisbury (Australia).
FORMATS USED IN THE W.R.E. DATA PROCESSING SYSTEM.
Nov 65, 60p
Its Specification Wre 247, Issue 2

Descriptors: Camera, Computer, Conversion, Converter, Data, *Data conversion, Film, *Ibm 7090 computer, Information, *Information processing, Instrument, Magnetic, Processing, Programming, Radar, Tape, Telemetry, Tunnel, Wind.

For abstract, see S 04 13.

N66-26237 **Field 5B**
CFSTI Prices HC$5.00 MF$1.00
Computer Concepts, Inc., Los Angeles, Calif.
THE ROLE OF COMPUTERS IN HANDLING AEROSPACE SYSTEMS HUMAN FACTORS TASK DATA FINAL REPORT, 3 JUN. 1964 - 3 JUN. 1965.
by I. R. Whiteman. Dec 65, 196p NASA-CR-75081, AMRL-TR-65-206
Contract NASA ORDER R-115, AF 33/615/-1557
196 P Refs

Descriptors: Aerospace, *Aerospace system, Computer, *Computer method, Data, Factor, Human, *Human factor, Method, Processing, System, Task.

For abstract, see S 04 14.

N66-34316 **Field 5B**
CFSTI Prices HC$1.00 MF$0.50
Computer Sciences Corp., El Segundo, Calif.
INFORMATION RETRIEVAL AND ENGINEERING AIDS SYSTEM FINAL REPORT.
15 Jul 66, 21p NASA-CR-65454
Contract NAS9-3710

Descriptors: Apollo project, Computer, *Computer programming, Development, Engineering, *Engineering development, File, Generator, Ground, Information, *Information retrieval, Input, Manned, *Manned spacecraft, Operation, Programming, Reliability, Retrieval, Sorting, Spacecraft, Support, System.

For abstract, see S 04 20.

N66-34366 **Field 5B**
CFSTI Prices HC$1.00 MF$0.75
National Aeronautics And Space Administration, Washington, D. C.
INDEX TO NASA TECH BRIEFS, JANUARY JUNE 1966.
Aug 66, 62p NASA-SP-5021/03/

Descriptors: *Bibliography, Electric, Electronic, Energy, Index, Life, Literature, Material, Mechanical, *Nasa program, Physical, Research, Science, Source, *Technology.

For abstract, see S 04 20.

N66-35013 **Field 5B**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
RESEARCH AND ADVANCED DEVELOPMENT PUBLICATIONS OF THE JET PROPULSION LABORATORY, FISCAL YEAR 1965.
1 Jul 66, 21p NASA-CR-77377

Descriptors: *Bibliography, Chemical, Electric, Electronics, Factor, Human, *Nasa program, Nuclear, Power, Project, Propulsion, Publication, Research, *Research project, Rocket, Space, Space vehicle, System.

For abstract, see S 04 20.

PB-170 659 **Field 5B**
CFSTI Prices: HC$1.10 MF$0.50
Rochester Univ., N. Y.
A SHORT TITLE CATALOG MADE WITH IBM TABULATING EQUIPMENT.
by Phylis A. Richmond. 1963, 10p
Reprinted from Library Resources and Technical Services, v7 n1 winter 1963.

Descriptors: (*Data storage systems, Catalogs), Libraries, Punched cards, Information retrieval, Computers.

A detailed description of the tabulating process is presented; a sample of the printed catalog is shown.

PB-170 660 **Field 5B**
CFSTI Prices: HC$1.10 MF$0.50
Herner and Co., Washington, D. C.
EFFECT OF AUTOMATED INFORMATION RETRIEVAL SYSTEMS ON AUTHORS.
by Saul Herner. 1966, 2p
Contract AF 49 (638)-1182
NSF Scientific Documentation Project. Published in American Documentation Institute, Proceedings Annual Meeting (26th) Chicago, Ill. Oct 1963. Rept. on Automation and Scientific Communication, Topic 1; Generation of Information.

Descriptors: (*Information retrieval, Automatic), (*Reports, Preparation), Abstracting, Indexes, Subject indexing, Documentation.

Consideration is given to the present and future effect of automated systems on authors, and to the steps that authors, editors, and other generators of information can take to foster the smoothest possible assimilation of their outputs by automated storage and retrieval systems.

PB-170 661 **Field 5B**
CFSTI Prices: HC$1.10 MF$0.50
Herner and Co., Washington, D. C.
THE ROLE OF THESAURI IN THE CONVERGENCE OF WORD AND CONCEPT INDEXING.
by Saul Herner. Oct 63, 2p
Contract AF 49 (638)-1182
NSF Scientific Documentation Project. Published in American Documentation Institute, Proceedings, Annual Meeting (26th) Chicago, Ill Oct 1963.

Descriptors: (*Subject indexing, Vocabulary), Information retrieval, Control, Indexes, Preparation, Documentation.

The increase in indexing vocabularies guiding the use of terms and indicating their relationship has resulted in a convergence between word and concept indexing. Vocabularies have emerged as devices for converting from words to concepts. The intellectual role of the indexer has shifted to the vocabulary designer. Current manifestations of this shift are discussed. (Author)

PB-170 687 **Field 5B**
CFSTI Prices: HC$1.00 MF$0.50
Westat Research Analysts, Inc., Denver, Colo.
COST MODELS FOR DETERMINING OPTIMUM DOCUMENT REPRODUCTION POLICIES AT CFSTI.
by D. W. King, and R. R. V. Wiederkehr. 1966, 20p

Descriptors: (*Reports, Reproduction), (*Costs, Optimization), Dissemination, Decision theory, Printing, Documentation, Information retrieval, Mathematical prediction, Mathematical models.

Identifiers: Clearinghouse for Federal Scientific and Technical Information.

Two cost models were developed at CFSTI for determining optimum document reproduction policies: a restock model and a prestock model. The restock model allows one to find the restock print quantity that minimizes the cost for the stock print policy. Comparison of this minimum cost with the cost of reproducing singly allows one to determine which of the two policies is more economical. Similarly, the prestock model allows one to determine whether or not to prestock print and if so to find the prestock print quantity that minimizes the costs for prestock printing. These models are very flexible in that they are capable of being applied over wide ranges of values for: (i) prior demand, (ii) time since announcement, (iii) number of copies on the shelf at the time of the restock decision, (iv) the number of original copies available for dissemination, (v) reproduction costs. (Author)

PB-170 768 **Field 5B**
CFSTI Prices: HC$1.10 MF$0.50
Little (Arthur D.) Inc., Cambridge, Mass.
RESEARCH ON A LINEAR NETWORK MODEL AND ANALOG DEVICE FOR ASSOCIATIVE RETRIEVAL.
by Paul E. Jones. 1963, 2p
Contract AF 19 (628)-256
Automation and Scientific Communication, Topic 5: Analysis, Indexing and Correlation of Information. Proceedings of American Documentation Institute Meeting (26th Annual) Chicago p211-2 1963. NSF Scientific Documentation Project.

Descriptors: (*Information retrieval, Model theory), Analog systems, Linear systems, Electrical networks, Word association, Scientific research.

In his investigations at Arthur D. Little, Inc., the author pursued the applicability of linear network analysis to the retrieval of information from a given body of data. This point of view provides a framework which encompasses many of the parameters of the retrieval process and enables analytic exploration of the model. (Author)

PB-170 792 **Field 5B**
CFSTI Prices: HC$1.00 MF$0.50
Wayne State Univ., Detroit, Mich. School of Medicine.
THE INTERLIBRARY LOAN TRANSACTION.
by Vern M. Pings. 1965, 11p
NSF Scientific Documentation Project. Bulletin of the Medical Library Association v53 n2 p204-14 Apr 1965.

Descriptors: (*Information retrieval, Reports), (*Libraries, Information retrieval), Biology, Medicine, Data, Costs.

Although the number of items borrowed through interlibrary loan may not increase as dramatically as it has in the past ten years, the trend can be expected to continue because of the growing interdisciplinary nature of biomedical research and because of the anticipated improved bibliographic control of biomedical literature. To provide a framework for collecting data on volume of flow between insitutions, on the efficiency of communication channels, and on alternative procedures for performing the transaction, block diagrams were prepared to show the flow of information and materials between individuals and institutions. These diagrams show the interinsitutional dependence; any alterations in procedures in one institution affect other insitutions. Even though it can be clearly shown where alterations in the flow pattern can be effected, there are little quantitative data available to serve as a justification for maintaining or modifying existing procedures. (Author)

PB-170 812 **Field 5B, 9B**
CFSTI Prices: HC$2.60 MF$0.50
Bolt, Beranek and Newman, Inc., Cambridge, Mass.
ON THE LENGTH OF A CLASS OF SERIAL FILES.
by Mario Grignetti. 1962, 27p
NSF Scientific Documentation Project.

Descriptors: (*Data storage systems, Information retrieval), (*Information retrieval, Data storage systems), Programming (Computers), Documentation.

A Class of serial files is considered, where each entry is divided into two parts: the Name and the Description. One way to reduce the time involved in machine searches over such a file consists of compressing the information contained in the entry so that its length is shortened. In this paper, existing coding procedures are examined and average lengths determined, revising some previous results. Finally, a new code of quasi-minimal length is proposed. (Author)

PB-170 837 **Field 5B**
CFSTI Prices: HC$1.10 MF$0.50
American Psychological Association, Washington, D. C. Project on Scientific Information Exchange in Psychology.
SYSTEMS IN SCIENTIFIC INFORMATION EXCHANGE AND THE EFFECTS OF INNOVATION AND CHANGE.
by Belver C. Griffith, and William D. Garvey.
1964, 10p
NSF Scientific Documentation Project. Proceedings-American Documentation Inst., 1964 p191-200.

Descriptors: (*Documentation, Dissemination), (*Dissemination, Documentation), Systems engineering.

Possible innovations in disseminating, storing and retrieving research reports are viewed against some data and theory on scientific information exchange. While certain innovations may simply ameliorate particular problems, others may have far reaching effects, even extending into the conduct of scientific work or the organization of the science into subareas. (Author)

PB-170 840 **Field 5B, 6-**
CFSTI Prices: HC$1.10 MF$0.50
Yale Univ., New Haven, Conn. Medical Library.
DENSITY OF LIBRARY BOOK USE IN BIOLOGY AND MEDICINE.
by Frederick G. Kilgour. 1963, 2p
NSF Scientific Documentation Project. Proceedings of the American Documentation Institute, Chicago, Ill., p263-4 Oct 1963.

Descriptors: (*Information retrieval, Libraries), (*Biology, Information retrieval), (*Medicine, Information retrieval), Textbooks, Periodicals, Reports.

Use quotients were obtained by dividing numbers of book volumes published in 1951-62 and circulated in one year by volumes in the Library's corresponding subject classes. Books of the last dozen years experienced six times as concentrated use as the entire book and journal collection. (Author)

PB-170 975 **Field 5B**
CFSTI Prices: HC$3.00 MF$0.50
National Science Foundation, Washington, D. C.
COMPUTER APPLICATIONS IN SCIENTIFIC PUBLICATION.
3 Feb 66, 51p
Transcript of Proceedings, Information Systems Colloquium, Washington, D. C., Feb. 3, 1966.
NSF Scientific Documentation Project.

Descriptors: (*Data processing systems, *Documentation), Computers, Periodicals, Programming (Computers), Reports.

Contents: Problems of machine recording of textual information during scientific publication, by Lawrence F. Buckland; Computers, scientific periodicals, and science information handling--Objectives of present studies by Joseph H. Kuney; Computer composition of scientific manuscripts by B. G. Lazorchak; Programming approach by S. W. Walcavich; Processing mathematical text for publication by Dr. Gordon L. Walker.

PB-170 997 **Field 5B**
CFSTI Prices: HC$4.60 MF$0.50
National Science Foundation, Washington, D. C. Office of Science Information Service.
COMPARATIVE STUDIES OF RETRIEVAL SYSTEMS: PROBLEMS AND PROSPECTS.
by E. Pronko. 29 Oct 63, 44p
NSF Scientific Documentation Project. Pub. in Materialy Zasedaniya Rabochei Gruppy No. 2 YuNESKO po voprosu 'Avtomatizatsiya Informatsii -- poisk i Khranenie' p24-68, Moscow.

Descriptors: (*Information retrieval, State-of-the-art reviews), Automation, Documentation, Data processing systems, Digital computers, Systems engineering.

The purpose of this paper is to summarize briefly some of the various studies, experiments, tests, and evaluations of documentation systems that have been or are being conducted; to focus attention on the problems involved in making comparisons and evaluations of systems; and to emphasize the need for developing adequate criteria, methods, and procedures for testing and evaluating the many techniques, devices, and systems designed for or adaptable to automatic documentation. (Author)

PB-172 869 **Field 5B, 15E**
CFSTI Prices: HC$1.00
Air Force Systems Command, Washington, D. C.
MANAGEMENT OF CONTRACTOR DATA AND REPORTS. VOLUME I.
Joint AFSC/AFLC Manual.
15 Mar 64, 21p AFSCM-310-1
AFLCM-310-1
Prepared in cooperation with Air Force Logistics Command, Wright-Patterson AFB, Ohio. AFSCM-310-1/AFLCM-310-1, 18 Nov 63 superseded.

Descriptors: (*Data, Processing), (*Reports, Processing), Logistics, Documentation, Management control systems, Instruction manuals.

The manual announces policies, assigns responsibilities, and prescribes management procedures established and approved by Headquarters AFSC/AFLC to identify, select, acquire, control, and keep to a practical minimum the essential data required by the Air Force from defense contractors. It implements AFR 310-1. It applies to the data requirements of all agencies incident to their participating in or supporting the definition, development, procurement, test, and follow-on logistic management of USAF systems, subsystems, equipment, items, and logistic support programs. The manual consists of two volumes. Volume I prescribes policies, procedures, and general information for management of data. (Author)

PB-173 082 **Field 5B**
CFSTI Prices: HC$2.00 MF$0.50
Meteorological and Geoastrophysical Abstracts, Washington, D. C.
QUALITATIVE-QUANTITATIVE EVALUATION OF GEOPHYSICAL SERIALS.
by Geza Thuronyi, and Malcolm Rigby. Feb 66, 32p
Grant NSF-GN-390
Appendices PB-173 083.

Descriptors: (*Geophysics, Periodicals), (*Documentation, Geophysics), Indexes, Effectiveness, Analysis.

Some 27,600 citations of authors writing in the Journal of Geophysical Research were recorded and analyzed (by computer) as to journal cited and country of origin, language and age of article cited. Particular attention was paid to the RPR index (ratio of cited to published articles) of journals, and to the evolution of citations of translations. The usefulness of the RPR index as an objective criterion of journal value is found to be limited, and preparation of journal registers is recommended as a basis for more meaningful journal evaluation. Some salient features of the citing habits of U.S., other English-speaking and non-English speaking authors in regard to country and language cited are noted. A definite, although somewhat late (1964) impact of translation programs is clearly discernible. (Author)

PB-173 083 **Field 5B**
CFSTI Prices: HC$2.00 MF$0.50
Meteorological and Geoastrophysical Abstract, Washington, D. C.
QUALITATIVE-QUANTITATIVE EVALUATION OF GEOPHYSICAL SERIALS.
Appendices.
Feb 66, 44p
Grant NSF-GN-390
Basic rept. PB-173 082

Descriptors: (*Geophysics, Periodicals), (*Documentation, Geophysics), Indexes, Effectiveness, Analysis.

PB-173 176 **Field 5B, 5G**
CFSTI Prices: HC$1.10 MF$0.50
Wayne State Univ., Detroit, Mich.
RESEARCH IN AUTOMATIC RUSSIAN-ENGLISH SCIENTIFIC AND TECHNICAL LEXICOGRAPHY.
Rept. for 1 Jul 65-30 Jun 66.
by Harry H. Josselson. 30 Jun 66, 10p
Grant NSF-GN-430
NSF Scientific Documentation Project.

Descriptors: (*Russian language, Dictionaries), (*Dictionaries, Russian language), Linguistics, English language, Machine translation, Documentation, Data processing systems.

The research methodology during the course of the first year of this investigation has involved four

distinct phases: (1) dictionary selection and pre-editorial processing; (2) copy preparation and key-punching of input dictionaries; (3) systems programming; and (4) micro-glossary production. (Author)

AD-639 194 See Field 6E

PB-170 801 See Field 5F

PB-170 834 See Field 5J

PB-170 835 See Field 5J

PB-170 839 See Field 5J

PB-170 988 See Field 5J

5C. ECONOMICS

AD-639 128 **Field 5C, 5K**
CFSTI Prices: HC$2.00 MF$0.50
RAND Corp., Santa Monica, Calif.
AN EXPERIMENT IN UNDERSTANDING: THE HARVARD PROGRAM, TWO YEARS AFTER.
by Emmanuel G. Mesthene. Sep 66, 33p P-3433

Descriptors: (*Economics, *Sociology), Biology, Medicine, Commerce, Documentation, Education, Industries, Employment, Production, Automation.

Identifiers: Technology, Information sciences.

Seven substantive areas that suggest the emerging shape of the Harvard Program on Technology and Society are: the social implications of biomedical technology; information technology and the process of education; the interaction of technological and social change; work and employment; institutional processes of adaptation to change; technology and business; and science and democracy. The Program is inquiring into the effects of rapid technological change on the economy, on public policies, and on the character of the society, as well as into the reciprocal effects of social change on the nature, dimension, and directions of scientific and technological developments. (Author)

AD-639 129 **Field 5C**
CFSTI Prices: HC$3.00 MF$0.75
RAND Corp., Santa Monica, Calif.
CAPITAL FORMATION IN COMMUNIST CHINA.
by K. C. Yeh. Aug 66, 60p P-3251

Descriptors: (*China, *Economics), Industries, History, Money, Agriculture.

Identifiers: Investments.

The paper examines the trends in capital formation in 1952-59 and discusses implications suggested by the statistical findings. The term capital formation, or investment for short, is used in the conventional sense. Sections I-III deal with the rate of investment, the structure of investment by types of capital goods, and the pattern of allocation of fixed investment by major economic sectors. To provide a gauge for appraisal of the data, the results are compared with the corresponding estimates for China in 1931-36 and with selected countries in the postwar period. Section IV discusses preliminary observations on investment and growth in Communist China in the 1950s. (Author)

AD-639 569 **Field 5C, 5K**
CFSTI Prices: HC$3.00 MF$0.75
Cowles Foundation for Research in Economics, Yale Univ., New Haven, Conn.
SIMULATION OF SOCIO-ECONOMIC SYSTEMS. PART II. AN AGGREGATIVE SOCIO-ECONOMIC SIMULATION OF A LATIN AMERICAN COUNTRY.
by Martin Shubik. 8 Aug 66, 62p Discussion paper-203-Pt-2
Contract Nonr-3055 (00)

Descriptors: (*Latin America, *Economics), (*Sociology, Latin America), Simulation, Mathematical models, Money, Wages, Population, Equations.

Identifiers: Investments, Gross national product, Income.

The simulation is directed towards portraying some of the basic features of a Latin American country with a large Indian population. Peru, Ecuador, Bolivia, Honduras, Guatamala, and Nicaragua fall into this category. It utilizes in part the national economic accounts format developed in the Country Study Program of the Yale Economic Growth Center and the financial statistical reporting of the International Monetary Fund and World Bank. The model constructed is primarily macroeconomic with a four social sector disaggregation. The four sectors are commercial whites, agricultural whites, mestizos, and Indians. Except for several logical switches which enable the program to execute policy or other decision changes the system is composed of a series of interlinked difference equations. The simulation is a 'representative unit,' 'fixed clock' model. This means it is so highly aggregated that any sector such as 'the mestizos' is represented by a solitary behavior equation rather than a sample of behavioral units. The fixed clock feature of the model implies that all activities are updated at regular time intervals. There are no distributed lags to smooth the behavior of the behavioral units. The current model contains approximately 120 equations, of which 30 are accounting; 80 are behavioral; and 10 are planning or policy relations which are for the most part treated as exogenous.

N66-24942 **Field 5C**
CFSTI Prices HC$3.00 MF$0.50
Washington Univ., St. Louis, Mo.
EMPIRICAL EVIDENCE ON THE GEOGRAPHIC AND INDUSTRIAL DISTRIBUTION OF AEROSPACE EXPENDITURES.
by R. A. Bohm. Apr 66, 60p NASA-CR-74770
Grant NSG-342
Its Working Paper No. 6528

Descriptors: Aerospace, Aircraft, Analysis, *Economics, Effect, Electronics, *Gemini project, *Industry, Instrument, Manufacturing, Project, Region.

For abstract, see S 04 13.

PB-169 293-1 **Field 5C**
CFSTI Prices: HC$2.00 MF$0.50
International Customs Tariffs Bureau, Brussels (Belgium).
UNITED STATES OF AMERICA.
11th ed., Year 1965-1966.
Apr 66, 36p
Pub. as International Customs Journal Bull-21 (1st Supplement to).

Descriptors: (*Commerce, *United States), (*Costs, Commerce), Law, Industrial production, Belgium.

Identifiers: Customs laws, Tariffs.

PB-170 590 **Field 5C, 9B**
CFSTI Prices: HC$3.00 MF$0.75
Battelle Memorial Inst., Columbus, Ohio.
FEASIBILITY OF COMPUTER STORAGE AND RETRIEVAL OF FREIGHT TARIFF INFORMATION, PHASE I.
Research rept.
May 66, 62p
Contract CC-6206

Descriptors: (*Cargo, Costs), (*Data processing systems, Feasibility studies), Data storage systems, Information retrieval, Computers.

Identifiers: Tariffs.

The purpose of the project was to determine the feasibility of computer storage and retrieval of freight tariff information on file with the Interstate Commerce Commission. The objective of Phase I of the project was the development of a general logic for computerization of tariff information. It included the testing of specific algorithms for the following items of tariff information: origin, commodity, destination, effective date, expiration date, status, mode, submode, conveyance, origin/carrier, destination/carrier, and rate category.

PB-170 591 **Field 5C, 9B**
CFSTI Prices: HC$7.00 MF$1.50
Battelle Memorial Inst., Columbus, Ohio.
FEASIBILITY OF COMPUTER STORAGE AND RETRIEVAL OF FREIGHT TARIFF INFORMATION, PHASE I.
Technical annex.
May 66, 319p
Contract CC-6206
See also PB-170 590.

Descriptors: (*Cargo, Costs), (*Data processing systems, Feasibility studies), Data storage systems, Information retrieval, Computers, Programming (Computers).

Identifiers: Tariffs.

The purpose of the project was to determine the feasibility of computer storage and retrieval of freight tariff information on file with the Interstate Commerce Commission. The objective of Phase I of the project was the development of a general logic for computerization of tariff information. It included the testing of specific algorithms for the following items of tariff information: origin, commodity, destination, effective date, expiration date, status, mode, submode conveyance, origin/carrier, destination/carrier, and rate category.

PB-170 849 **Field 5C**
CFSTI Prices: HC$7.00 MF$1.75
International Customs Tariffs Bureau, Brussels (Belgium).
BELGIUM-NETHERLANDS-LUXEMBURG (BENELUX).
6th ed., Year 1965-1966.
Mar 66, 366p
Pub. as International Customs Journal Bull-8.

Descriptors: (*Commerce, *Costs), (*Belgium, Commerce), (*Netherlands, Commerce), Law, Industrial production, Statistical data.

Identifiers: Luxemburg, Customs laws, Tariffs.

PB-173 100 **Field 5C**
CFSTI Prices: HC$1.00 MF$0.50
International Customs Tariffs Bureau, Brussels (Belgium).
NIGERIA.
8th ed., Year 1965-1966.
Jun 66, 6p
Pub. as International Customs Journal Bull-134, 1st suppl.

Descriptors: (*Commerce, *Nigeria), (*Costs, Commerce), Corrections, Industrial production, Belgium, Statistical data, Law.

Identifiers: Customs laws, Tariffs.

PB-173 101 **Field 5C**
CFSTI Prices: HC$1.00 MF 3 53
International Customs Tariffs Bureau, Brussels (Belgium).
MOROCCO (KINGDOM OF).
7th ed.
Apr 66, 13p
Pub. as International Customs Journal Bull-132, suppl. 1.

Descriptors: (*Commerce, *Morocco), (*Costs, Commerce), Law, Corrections, Industrial production, Statistical data, Belgium.

Identifiers: Customs laws, Tariffs.

PB-173 106 **Field 5C, 8F, 8G**
CFSTI Prices: HC$3.00 MF$0.50
Philgite Co., Inc., Philadelphia, Pa.
INVESTIGATION OF THE VANPORT LIMESTONE AND ASSOCIATED COAL BEDS IN ARMSTRONG AND CLARION COUNTIES, PENNSYLVANIA WITH PARTICULAR EMPHASIS ON THE ALLEGHENY RIVER VALLEY (WITH PERTINENT COAL PRODUCTION STATISTICS).
12 Oct 65, 55p
Contract C-293-65 (Neg.)

Descriptors: (*Economics, Pennsylvania), (*Industries, Pennsylvania), (*Limestone, Pennsylvania), (*Pennsylvania, Limestone), Chemical industry, Coal, Stratigraphy, Mining engineering, Structural geology, Economic geology.

The report encompasses four salient points: (1) identification of the most important commercial limestone in western Pennsylvania - the Vanport Limestone; (2) description of the locations of active mines and quarries in the Allegheny River Valley of Armstrong and Clarion Counties, Pennsylvania that extract the Vanport Limestone; (3) presentation and interpretation of structural and stratigraphic geologic data pertaining to the Vanport Limestone in the bi-county area; and (4) evaluation of past use, present status, and future potential of the Vanport Limestone in the Allegheny River Valley.

PB-173 107 **Field 5C, 8F**
CFSTI Prices: HC$5.00 MF$1.00
North Star Research and Development Inst., Minneapolis, Minn.
A STUDY OF THE FEASIBILITY OF ESTABLISHING A CHEMICAL AND PLASTICS INDUSTRY IN NORTHEASTERN MINNESOTA.
Final rept., phase 2.
by M. A. Hanson, and D. E. Lodge. 18 Sep 65, 174p
Contract Cc-6154
Prepared in cooperation with Area Redevelopment Administration, Washington, D. C.

Descriptors: (*Economics, Minnesota), (*Chemical industry, Minnesota), (*Plastics industry, Minnesota), Feasibility studies, Containers, Plastics, Industries, Industrial production, Acetal plastics, Thermosetting plastics, Polyester plastics.

Identifiers: Area redevelopment.

A recommendation for the establishment of a blow molded bottle plant in northeastern Minnesota was independently anticipated by the establishment of a blow molding plant in Crosby, Minnesota, in August, 1965. Therefore, the implementation of Phase 3 for the blow molding plant should be held in abeyance so that the newly established venture is not jeopardized by an overexpansion of production capacity in the area. The limited market studies for formaldehyde and thermosetting plastics resins indicate probable feasibility for the production of these items. The establishment of these plants would result in contributions to the local economy in direct employment and in indirect benefits to industrial users of these products. Therefore, it is recommended that the preliminary studies be expanded to determine more specifically the market and production characteristics. Market conditions include the quantities of various resin formulations being used, current prices, and present sources of supply. The unit production costs, the degree of market penetration, and the profitability of these plants should also be determined.

PB-173 115 **Field 5C, 8F**
CFSTI Prices: HC$3.00 MF$0.75
Philgite Co., Inc., Philadelphia, Pa.
AN EXAMINATION OF BARGE OPERATIONS ON THE ALLEGHENY RIVER WITH EMPHASIS ON OPERATING RESTRICTIONS.
1 Sep 65, 81p
Contract C-293-65 (Neg)

Descriptors: (*Economics, Pennsylvania), (*Inland waterways, Pennsylvania), (*Rivers, Transportation), (*Pennsylvania, Inland waterways), Barges, Shipping, Industrial plants, Dams, Traffic, Law.

Identifiers: Allegheny River.

The study involved an examination of water transportation on the Allegheny River with emphasis on any restrictive conditions pertinent to barge operations in the vicinity of a tentatively selected industrial site at Reesedale, Pennsylvania. Contents include: General discussion of the Allegheny River; Barge traffic patterns; Barge types and operations; Regulations concerning the navigation and use of the Allegheny River; Restrictions of barge operations.

AD-638 810 **See Field 5D**

AD-638 952 **See Field 5A**

AD-639 387 **See Field 15C**

PB-170 686 **See Field 9B**

PB-170 789 **See Field 1B**

PB-173 105 **See Field 5I**

PB-173 169 **See Field 13B**

5D. HISTORY, LAW, AND POLITICAL SCIENCE

AD-638 801 **Field 5D**
CFSTI Prices: HC$3.00 MF$0.50
RAND Corp., Santa Monica, Calif.
SOVIET MILITARY POWER AND EUROPEAN SECURITY.
by Thomas W. Wolfe. Aug 66, 52p P-3429
Prepared for presentation at a meeting of the Atlantic Inst., Oct 66.

Descriptors: (*Cold war, History), (*USSR, Foreign policy), (*Western Europe, Foreign policy), Eastern Europe, Military strategy, Armed forces (Foreign), Defense systems.

Identifiers: Warsaw Pact, Stalin, Khrushchev, NATO.

CONTENTS: Stalin's military policies in the early postwar years; development of the Soviet military posture up to Stalin's death; new policy style under Khrushchev; military problems and reforms of the Khrushchev era; Soviet military policy under the Brezhnev-Kosygin regime; Soviet thinking on the likelihood and nature of war in Europe; evolving character of the Warsaw pact.

AD-638 810 **Field 5D, 5C**
CFSTI Prices: HC$1.00 MF$0.50
RAND Corp., Santa Monica, Calif.
BOOK REVIEW: THE PROCESS OF PLANNING, BY A. H. HANSON.
by George Rosen. Sep 66, 5p P-3442

Descriptors: (*India, *Management planning), (*Political science, India), Economics, Reviews, History.

Identifiers: Book reviews.

AD-639 557 **See Field 22A**

NBS-MP-275 **See Field 14B**

PB-173 226 **See Field 13B**

5E. HUMAN FACTORS ENGINEERING

AD-639 026 **Field 5E, 1C**
CFSTI Prices: HC$3.00 MF$0.75
Psychological Corp., New York.
AN ANALYSIS OF PILOTS' PERFORMANCES IN MULTIENGINE AIRCRAFT (R5D).
by Jack W. Dunlap, and Ralph C. Channell. 15 Apr 47, 59p
Contract N6ori-151 (01)
Proj. 20-0-1
SPECDEVCEN-151-1-1, NAVMED-X-651

Descriptors: (*Human engineering, *Cockpits), (*Pilots, Performance (Human)), Aircraft, Flight instruments, Job analysis, Instrument panels, Reaction (Psychology), Reflexes.

The principles of job analysis and of time and motion were applied to the task of flying a multi-engine aircraft, the R5D (the Navy equivalent of the C-54 or DC-4). Cinematographic records and voice recordings were made by two aviation psychologist during scheduled flights in July and August of 1946. These records are analyzed to determine if the methods used in industry are productive and practicable when applied to piloting.

AD-639 029 **Field 5E, 5H**
CFSTI Prices: HC$3.60 MF$0.50
Psychological Corp., New York.
THE USE OF HUMAN ENGINEERING DATA IN EQUIPMENT DESIGN PROBLEMS.
by John D. Coakley. Sep 59, 33p
Contract N6ori-151 (01)
Proj. 20-F-2
NAVTRADEVCEN-151-1-16

Descriptors: (*Human engineering, Man-machine systems), Design, Machines, Operations research, Control systems, Display systems, Submarines.

The purpose of the report is to cite examples of design problems which are typical of those encountered in consulting work. The manner in which recommendations are derived by reconciling pertinent experimental data with the specific requirements of the equipment is discussed. The cases cited illustrate the various degrees of confidence with which recommendations are made, and point up the areas in which further research is needed. The examples are gathered from studies of equipment designed for use aboard submarines. However, the problems encountered and the method of approach are probably typical of large areas in the field of applied human engineering. (Author)

AD-639 143 **Field 5E, 5J**
CFSTI Prices: HC$2.00 MF$0.50
Mount Holyoke Coll., South Hadley, Mass. Psychophysical Research Unit.
THE SPEED AND ACCURACY OF DISCRIMINATING DIFFERENCES IN HUE, BRILLANCE, AREA, AND SHAPE.
Technical rept.
by J. B. Reed. Sep 51, 31p
Contract Nonr-131 (01)
Projs. NR-784-001, 20-L-2
SPECDEVCEN-131-1-2

Descriptors: (*Visual signals, Coding), (*Human engineering, Visual signals), Visual perception, Colors, Geometric forms, Classification.

CONCLUSIONS: People can discriminate differences in hue and in shape faster and more accurately than differences in area or in brilliance. On any visual display, therefore, the most important symbols should differ in hue or in shape. As the difference between two areas or two hues is increased, discrimination time is decreased. After

a while, increasing the difference between two hues or two areas has no effect on discrimination time. That is, this time gradually approaches a constant discrimination time for both aspects. This constant discrimination time seems to be the same whether we are discriminating hue differences or shape differences. Therefore, the time required to discriminate very large stimulus differences may be the same no matter what aspect we are looking at. (Author)

AD-639 144 **Field 5E, 5J**
CFSTI Prices: HC$2.00 MF$0.50
Mount Holyoke Coll., South Hadley, Mass. Psychophysical Research Unit.
THE SPEED AND ACCURACY OF DISCRIMINATING DIFFERENCES IN SINGLE AND COMPOUND ASPECTS OF VISION.
Human engineering rept.
by J. B. Reed. Sep 52, 28p
Contract Nonr-131 (01)
SPECDEVCEN-131-1-4
See also AD-639 143.

Descriptors: (*Visual signals, Coding), (*Human engineering, Visual signals), Visual perception, Colors, Geometric forms, Classification.

CONCLUSIONS: People discriminate the compound hue and shape faster than any other compound, whether or not other aspects vary in a given group of symbols. Hue and area, and hue and brilliance require very little more discrimination time than hue and shape. It would seem that hue is an aspect that consistently forms compounds that are quickly discriminated. Compounds are, in general, discriminated more accurately than single aspects. This difference in accuracy, however, is too small to be significant. There is no evidence that compounds are discriminated significantly faster than single aspects. Good single aspects such as hue or shape would probably be better than a compound of two aspects (in ordinary coding situations). There are indications that the speed of discriminating a compound is determined by the speed of discriminating the faster of the two aspects in that compound. (Author)

AD-639 365 **Field 5E**
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
THE DESIGN OF NUMERALS FOR USE IN COUNTER-TYPE INSTRUMENTS: A REVIEW OF THE LITERATURE.
by J. G. Gleason. 20 Dec 47, 25p
SPECDEVCEN-166-1-39

Descriptors: (*Numbers, Visibility), Display systems, Colors, Brightness, State-of-the-art reviews, Design.

(Conclusions: The size of the critical detail in the numerals should be as large as is possible within the necessary practical limitations of overall numeral size. Within these limitations, the larger the numeral of any given type, the greater will be its visibility. The contrast between the numeral and its immediate background should be as great as it is possible to provide. The brightness contrast between the dial area and the surround should preferably yield a ratio of one. If this is not possible, a reduction of surround brightness below the level of the dial area reduces legibility only slightly. A situation which yields surround brightness greater than dial areas is to be strenuously avoided as this condition greatly reduces acuity. The brightness level of the numeral and its background should be as high as is possible in the situation obtaining. For greatest visibility, other factors held equal, numerals should be either black or white on opposite background. In order of decreasing visibility, in all cases inferior to black on white or white on black, are black on yellow, yellow-green, orange, green, red, blue-green, and blue. (Author)

AD-639 366 **Field 5E**
CFSTI Prices: HC$6.00 MF$1.25
Johns Hopkins Univ., Baltimore, Md.
LECTURES ON MEN AND MACHINES. AN INTRODUCTION TO HUMAN ENGINEERING.
by Alphonse Chapanis, Wendell R. Garner, Clifford T. Morgan, and Fillmore H. Sanford. 1947, 257p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-19 NAVEXOS-P-459

Descriptors: (*Human engineering, *Man-machine systems), Systems engineering, Psychophysiology, Communication systems, Display systems.

Contents: Definitions, history and purpose; Methods in psychophysical systems research; The working environment; Work and the work-place; Operation, appraisal, selection and arrangement of equipment; Speech, communication and hearing; Special auditory informational systems; How we see; Display problems in psychophysical research; The future of human engineering.

AD-639 369 **Field 5E, 5H, 17I**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md.
MAXIMUM LIMITS OF WORKING AREAS ON VERTICAL SURFACES.
by K. O. William Sandberg, and Harold L. Lipshultz. 1952, 21p
SPECDEVCEN-166-1-8
Prepared in cooperation with Industrial Engineering Lab., New York Univ.

Descriptors: (*Positioning reactions, Radar operators), (*Radar equipment, *Human engineering), Anthropometry, Surfaces, Performance (Human).

The experiment measured the maximum area which can be reached on a flat vertical surface by the two arms of eight male subjects seated at varying viewing distances away from the surface. The paper discusses the influence of some of the variables: viewing distance, arm length, and body distance between pivot centers. It was found that each arm described an approximate circle whose diameter decreased as the distance between the subject and the flat vertical surface was increased. The three viewing distances of 10 inches, 15 inches, and 20 inches were selected as representative of actual operating practice. (Author)

AD-639 390 **Field 5E, 20F**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
VISIBILITY ON CATHODE-RAY TUBE SCREENS: THE EFFECTS OF LIGHT ADAPTATION.
by R. M. Hanes, and S. B. Williams. 20 Oct 47, 15p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-32
Availability: Published in Journal of the Optical Society of America v38 n4 p363-77 Apr 1948.

Descriptors: (*Visibility, *Cathode ray tube screens), Adaptation (Physiology), Vision, Experimental data.

An intensity modulated cathode-ray screen of the PPI type used in radar depends on differential brightness discrimination for detection of weak signals. The brightness quantities have been largely unknown, because of photometric difficulties, but it has commonly been assumed that dark-adaptation is required for efficient visual detection. Therefore, an experimental test was undertaken of the effects of light- and dark-adaptation on the contrast threshold and on time required for detection of supra-threshold signals appearing on a typical screen (P7 phosphor). Adapting brightnesses ranged from zero to 2000 millilamberts (mL). By special photometry, the four screen intensities used were estimated as ranging from 0.0001 mL to 0.22 mL. Length of exposure to the brightest adapting light and the degree of contrast between signal and background were also varied. The lowest contrast thresholds and the shortest detection times were found to occur when the test and adapting illuminations were equal or nearly so. When the two illuminations were unequal, the loss in sensitivity was roughly in proportion to their difference. The optimal field brightness of the phosphor screen used was on the order of 0.1 mL. With this field the level of adaptation of the eye can be a relatively insignificant factor in radar detection, even of weak signals. Increasing values of signal contrast allow progressive reduction in detection delay after exposure to the highest brightness. (Author)

AD-639 392 **Field 5E, 5J**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
ESTIMATIONS OF DISTANCE ON POLAR COORDINATE PLOTS AS A FUNCTION OF THE SCALE USED.
by N. R. Bartlett, J. D. Reed, and G. Duvoisin.
5 May 48, 19p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-44
Availability: Published in The Journal of General Psychology v41 p47-65 1949.

Descriptors: (*Human engineering, *Display systems), (*Radar equipment, Display systems), Visual perception, Psychometrics.

This paper concerns the role of the language of the scale which observers employ in estimating the position of a mark on a polar coordinate display. Previous determinations have shown the accuracy of distance judgments to be a function of the relative position of the stimulus. The question at stake about such functions is whether they reflect a common perceptual tendency in distance estimations, or whether instead they are artifacts of the number scales in which the judgments were expressed. The problem was undertaken as a part of a broad program of research dealing with visual communication on radar display devices. A common type of radar display, the polar coordinate plot, is a circular map with concentric circles marked off on the map to denote distances from the center. The task of the radar operator is to estimate the position of small marks on the display. This paper concerns judgments of that type, but presumably the findings can be generalized to apply to estimations of distance on other kinds of displays. The specific question attacked is whether three scales, with an identical number of subdivision units but with different names or tags for those units, will afford the same relative accuracy. Accuracy was analyzed in terms of two different indices: one is the mean constant error in the estimates for different positions, the other the standard deviation of those estimates about their mean. (Author)

N66-26686 **Field 5E**
CFSTI Prices HC$2.00 MF$0.50
Harvard School Of Public Health, Boston, Mass.
HUMAN PERFORMANCE IN ADVERSE ENVIRONMENTS.
by N. H. Mackworth, R. A. Mc farland, and W. H. Teichner. Mar 66, 39p NASA-CR-75185
Grant NSG-718

Descriptors: Astronaut, *Astronaut performance, Change, Coverage, Environment, *Environmental testing, Eye, Factor, Matching, Pattern, Performance, *Physiological factor, Physiology, Recognition, Scanning, Sight, Space flight, Stability, Test, Texture, Track.

For abstract, see S 04 14.

AD-638 794 **See Field 1D**

AD-638 868 **See Field 1C**

AD-639 027 **See Field 6S**

AD-639 028 **See Field 1D**

AD-639 126 See Field 15D

AD-639 281 See Field 5J

AD-639 282 See Field 5J

AD-639 285 See Field 5J

AD-639 291 See Field 5J

AD-639 364 See Field 5H

AD-639 371 See Field 17I

AD-639 376 See Field 17I

AD-639 384 See Field 5H

AD-639 563 See Field 5J

PB-173 159 See Field 13B

5F. HUMANITIES

PB-170 801 Field 5F, 5G, 5B
CFSTI Prices: HC$1.10 MF$0.50
Wales Univ., Cardiff.
WRITING-SCIENCE'S NEGLECTED SKILL.
by A. J. Kirkman. 1965, 4p
A. I. Ch. E.-I. Chem. E. Symposium Series No. 7, 1965 (London: Instn chem. Engrs). NSF Scientific Documentation Project.

Descriptors: (*Reports, Preparation), (*Vocabulary, Scientific personnel), Linguistics, Standards, Great Britain.

Identifiers: Writing.

Frequent complaints from industry about obscurity, ambiguity, and unreadability in scientific writing are justified. Investigation has shown that average scientific writing has logical and linguistic weaknesses. These weaknesses can be attributed partly to the average scientist's attitude to English and communication skills--apathy or even hostility. But the main causes of the weaknesses and the unsatisfactory attitudes are defects in school and university education and adverse industrial pressures. To correct the defects and attitudes, changes in teaching content and method are necessary; in particular, there must be more opportunities for practice of argument and exposition. In industry, managements must improve the facilities they provide for writing and must encourage scientific staff to recognise the full responsibilities that writing and editing involve. (Author)

PB-173 171 Field 5F, 14E, 13B
CFSTI Prices: HC$2.00 MF$0.50
Kansas State Highway Commission.
THE USE OF PHOTO INTERPRETATION IN ARCHEOLOGICAL SALVAGE PROGRAMS IN KANSAS.
Special rept.
by Alvis H. Stallard, and Thomas A. Witty Jr.
1966, 37p SR-2
Proj. 64-6

Descriptors: (*Kansas, Archaeology), (*Archaeology, Aerial photography), (*Photointerpretation, Archaeology), Roads, Photogrammetry, Aerial photographs, Scale.

Identifiers: Archaeological salvage.

The report is concerned with the use of aerial photographs in detecting archeological salvage sites. Archeological sites such as ceremonial circles, earthlodge sites, and burial and refuse mounds may display surface irregularities and soil discoloration and, therefore, are detectable. The scale of photography and current and past land use are factors that affect the discernibility of the archeological sites. Two scales of the aerial photography, 1:12,000 and 1:24,000, are recommended for the different types of archeological sites that were studied in this investigation. (Author)

AD-639 429 See Field 5G

5G. LINGUISTICS

AD-638 924 Field 5G
CFSTI Prices: HC$3.00 MF$0.50
RAND Corp., Santa Monica, Calif.
SOME COMBINATORIAL PROPERTIES OF RUSSIAN NOUNS.
by Kenneth E. Harper. Sep 66, 51p RM-5077-PR
Contract AF 49 (638)-1700

Descriptors: (*Russian language, Syntax).

Identifiers: Nouns.

An automatic retrieval program was applied to a parsed Russian text to determine the 'valence' of nouns in the text, i.e., the tendency of nouns to occur as the syntactic governor of a noun in the genitive case. Among nouns that occurred fifty times or more, a small proportion are characterized by either very low or very high valence: the valence of most nouns is intermediate, for a number of reasons not well understood. The valence of nouns in the latter group was very high for their first occurrence in a separate article. Considerable variation in valence was observed for nouns of the same semantic or derivational classes, but sample studies suggest that these differences are well correlated with certain other morphological or syntactic features. Our preliminary results suggest that (1) for some nouns, valence may be attributed to certain inherent semantic properties, and (2) for other nouns, valence may be highly correlated with other 'contextual' features, both syntactic and lexical. (Author)

AD-639 323 Field 5G, 5H, 9B
CFSTI Prices: HC$1.00 MF$0.50
Bolt Beranek and Newman, Inc., Cambridge, Mass.
PROBLEMS IN NATURAL LANGUAGE COMMUNICATION WITH COMPUTERS.
by Daniel G. Bobrow. Aug 66, 19p Scientific-5, BBN-1439
Contract AF 19 (628)-5065, ARPA Order-627
Proj. AF-8668
AFCRL-66-620

Descriptors: (*Man-machine systems, English language), Semantics, Data storage systems, Information retrieval, Transformational grammars, Syntax, Computers.

Identifiers: SENSE.

The paper gives an overview of the problems involved in the construction of a computer-based question-answering system designed to interact with the user in English. The system is viewed as containing five distinct parts - a parser, a semantic interpreter, an information storer, an information retriever, and an English output generator. There is a need for extensive interaction among these subsystems, and between the subsystems and the user. Examples are given of the type of processing done by each subsystem, and the nature of the possible interactions. The syntactic analysis described is based on a Chomsky type of transformational grammar. The semantic store is characterized by a form of the predicate calculus, with additional algorithms for computation, and structures designed for fast access to relevant data. (Author)

AD-639 429 Field 5G, 5K, 5F
CFSTI Prices: HC$2.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
LINGUISTIC MODERNISM AS THE DEHUMANIZATION OF THE SCIENCE OF LANGUAGE.
by V. I. Abayev. 13 Jun 66, 45p FTD-TT-2048 TT-66-62334
Unedited rough draft trans. of Voprosy Yazykoznaniya (USSR) n3 p22-43 1965.

Descriptors: (*Linguistics, Theory), Russian language, History, Culture, Grammars, Vocabulary, Social sciences, USSR.

PB-170 658 Field 5G
CFSTI Prices: HC$2.60 MF$0.50
Pennsylvania Univ., Philadelphia.
TRANSFORMATIONS AND DISCOURSE ANALYSIS PAPERS. 59. PARAPHRASTIC SETS AND GRAMMATICAL ANALYSIS. PART I.
by Irena Bellert, and Henry Hiz. 1965, 23p
NSF Scientific Documentation Project.

Descriptors: (*Transformational grammars, Analysis), Linguistics, Grammars, Documentation, English language.

PB-170 703 Field 5G
CFSTI Prices: HC$3.60 MF$0.50
Georgetown Univ., Washington, D. C. Machine Translation Research.
THE STRUCTURAL DELIMITATION OF PREPOSITIONAL CONSTRUCTIONS.
Occasional papers on machine translation.
by Milos Pacak. May 64, 31p Paper-37.
Sponsored in part by AEC. NSF Scientific Documentation Project.

Descriptors: (*Phrase structure grammars, Analysis), Syntax, Machine translation.

Identifiers: Prepositions.

The aims of the study of the preposition and the prepositional construction include the following: (a) The resolution of the ambiguity arising from the multiple morphosyntactic functions of the preposition where the preposition governs more than one case. (b) The resolution of the ambiguity arising from homographic forms in the preposition. (c) The resolution of the ambiguity in case and number in the nominals which are governed by the preposition in the prepositional construction. (d) The resolution of the ambiguity in case and number in the modifiers of the nominal in the prepositional construction. (e) The establishment of the boundaries of the prepositional construction in terms of the distribution of obligatory and non-obligatory elements within the prepositional construction. (f) The re-arrangement of any discontinuous sequences in the prepositional construction into sequences which correspond to the order of English, or of other languages similar to English. Author)

PB-170 704 Field 5G
CFSTI Prices: HC$2.60 MF$0.50
Georgetown Univ., Washington, D. C. Machine Translation Research.
A SYSTEM FOR SEMANTIC TRANSFER: PROLEGOMENA.
Occasional papers on machine translation.
by R. Ross Macdonald. Jun 64, 22p Paper-38
Sponsored in part by AEC. NSF Scientific Documentation Project.

Descriptors: (*Semantics, Theory), Russian language, English language, Machine translation.

Identifiers: Prepositions.

The paper proposes to outline a system for dealing with linguistic items, such as words, phrases and so on, as symbols having an extralinguistic value. Symbols in general are discussed first; linguistic symbols in particular are discussed later. The theoretical discussion is followed by a practical description of how the theory can be applied to the transfer of Russian prepositions into English. (Author)

PB-170 724 Field 5G
CFSTI Prices: HC$1.60 MF$0.50
Bell Telephone Labs., Inc., Murray Hill, N. J.
ON THE STATISTICS OF SPOKEN ENGLISH.
by P. B. Denes. 5 Feb 63, 14p

Published in the Journal of the Acoustical Society of America v35 n6 p892-904 Jun 1963. NSF Scientific Documentation Project.

Descriptors: (*English language, *Speech), Statistical analysis, Phonetics, Frequency.

A variety of statistical information about spoken English was obtained. The data are the results of analyzing a considerable body of conversational material and narrative taken from 'Phonetic Readers': the analyses were carried out by using a digital computer. The principles for selecting the speech material are discussed. Counts were obtained for the frequency of occurrence of phonemes, for the digram frequencies of phonemes, for word length, etc. Stress was taken into consideration, and many of the statistics were obtained separately for stressed and unstressed syllables. In addition, the frequency distribution of minimal pairs was obtained. Minimal pairs are the phoneme pairs that minimally distinguish one word from another. All results were evaluated from the articulatory point of view. It was found that, in spoken English, dental and alveolar articulations predominate and that manner rather than place of articulation is the dimension that carries by far the greatest functional load. (Author)

PB-170 790 **Field 5G**
CFSTI Prices: HC$1.60 MF$0.50
University Coll., London (England).
STUDIES IN THE CORRESPONDENCE OF PROSODIC TO GRAMMATICAL FEATURES IN ENGLISH.
by Randolph Quirk, Anne P. Duckworth, J. Svartvik, J. P. L. Rusiecki, and A. J. T. Colin. 1960, 13p
NSF Scientific Documentation Project.

Descriptors: (*English language, *Speech), (*Phonetics, English language), Grammars, Great Britain.

PB-170 821 **Field 5G**
CFSTI Prices: HC$1.10 MF$0.50
Edinburgh Univ., (Scotland). Dept. of Phonetics.
INFORMATION CONVEYED BY VOWELS.
by Peter Ladefoged, and D. E. Broadbent. 12 Jun 56, 7p
Prepared in cooperation with Medical Research Council Applied Psychology Unit, Cambridge (England). NSF Scientific Documentation Project. Pub. in Journal of the Acoustical Society of America v29 n1 p98-104 Jan 1957. NSF Scientific Documentation Project.

Descriptors: (*Linguistics, Information theory), (*Phonetics, Speech), Identification, Great Britain.

Identifiers: Vowels.

Most speech sounds may be said to convey three kinds of information: linguistic information which enables the listener to identify the words that are being used; socio-linguistic information, which enables him to appreciate something about the background of the speaker; and personal information which helps to identify the speaker. An experiment was carried out which shows that the linguistic information conveyed by a vowel sound does not depend on the absolute values of its formant frequencies, but on the relationship between the formant frequencies for that vowel and the formant frequencies of other vowels pronounced by that speaker. Six versions of the sentence Please say what this word is were synthesized on a Parametric Artifical Talking device. Four test words of the form b- (vowel)-t were also synthesized. It is shown that the identification of the test word depends on the formant structure of the introductory sentence. Some psychological implications of this experiment are discussed, and hypotheses are put forward concerning the ways in which all three kinds of information are conveyed by vowels. (Author)

PB-173 066 **Field 5G**
CFSTI Prices: HC$2.60 MF$0.50
System Development Corp., Santa Monica, Calif.
CONTROL OF STYLE WITH A GENERATIVE GRAMMAR.
by Sheldon Klein. 24 Jul 64, 26p SP-1633/001/00
NSF Scientific Documentation Project. Prepared for presentation at Summer Meeting of Linguistic Society of America (26th), Indiana Univ., Bloomington, 31 Jul-2 Aug 64.

Descriptors: (*Grammars, Control), English language, Phrase structure grammars, Automatic, Data processing systems.

CONTENTS: Automatic discourse paraphrasing system (dependency-phrase structure parser, generation, paraphrasing in essay format); Control of style; Discourse generation in the style of an input text.

PB-173 067 **Field 5G**
CFSTI Prices: HC$6.60 MF$0.75
System Development Corp., Santa Monica, Calif.
AUTOMATIC PARAPHRASING IN ESSAY FORMAT.
by Sheldon Klein. 21 Jul 64, 62p SP-1602/001/00
NSF Scientific Documentation Project. Prepared for presentation at Annual Meeting of Association for Machine Translation and Computational Linguistics (1964), Indiana Univ., Bloomington, 29-30 Jul 64.

Descriptors: (*Phrase structure grammars, Automatic), Data processing systems.

CONTENTS: Dependency-phase structure parsing system (phrase structure parsing with subscripted rules, dependency); Generation (grammatically correct nonsense, coherent discourse); An essay writing system (dependency analysis of an entire discourse, paraphrase formatting, generation of word forms not present in the source text, computer generated essays); Discussion (program, theoretical implications).

PB-173 069 **Field 5G**
CFSTI Prices: HC$1.10 MF$0.50
Welsh Coll. of Advanced Technology, Cardiff. Dept. of English and Liberal Studies.
ENGINEERS LOST FOR WORDS.
by A. J. Kirkman. 1964, 1p
NSF Scientific Documentation Project. The Engineer p889 22 May 1964.

Descriptors: (*Engineering personnel, Vocabulary), Word association, Tests, Great Britain.

How wide is the average engineer's vocabulary. Is it shortage of words that prevents many engineers making their meaning plain in succinct and readable prose. These questions have arisen during a study of the difficulties involved in communicating scientific and technological ideas (the aims and methods of which were reported in THE ENGINEER of February 1, 1963). This article describes an experimental attempt to get some facts to use in answering the questions. (Author)

PB-170 801 **See Field 5F**

PB-173 176 **See Field 5B**

5H. MAN-MACHINE RELATIONS

AD-639 049 **Field 5H, 6D, 9B**
CFSTI Prices: HC$4.00 MF$0.75
RAND Corp., Santa Monica, Calif.
CREATIVE REPRESENTATION WITH REGARD TO OPERATIONAL CORRESPONDENCE AND SEMI-ORDERED SYSTEMS.
by Norman Gilbreath. Sep 66, 101p RM-5079-PR
Contract AF 49 (638)-1700

Descriptors: (*Set theory, *Pattern recognition), (*Programming (Computers), Pattern recognition), Algorithms, Man-machine systems, Feedback, Creativity.

A description is given of a type of computer program which functions as a conceptual stimulant to augment the imagination of the researcher. The computer input is a class of instance-algorithms whose elements are sets. The computer generates a particular instance-algorithm and several of its elements. The researcher must evaluate results and formulate another class of instance-algorithms to be explored. By specifying only classes whose elements are sets, the researcher allows the computer a freedom to explore areas that initially may not seem interesting--thus creating the possibility of discovering unintuitive properties of the sets. The technique is applied to operational correspondence and semi-ordered systems. (Author)

AD-639 290 **Field 5H, 17I, 9E**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
VISIBILITY ON CATHODE-RAY TUBE SCREENS: PROBLEMS AND METHODS.
Technical rept.
by S. B. Williams, and N. R. Bartlett. Jul 56, 15p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-38

Descriptors: (*Cathode ray tube screens, Visibility), (*Radar equipment, Display systems), Visual perception, Visual signals, Plan position indicators.

The general features of equipment used in radar displays are described. Special features of PPI display judged to be of interest to psychologists are presented in some detail.

AD-639 364 **Field 5H, 5E**
Not available from CFSTI.
Purdue Univ., Lafayette, Ind.
THE EFFECT OF INSTRUMENT DIAL SHAPE ON LEGIBILITY.
by Robert B. Sleight. 5 Jan 48, 25p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-33
Availability: Published in Journal of Applied Psychology v32 n2 p170-88 Apr 1948.

Descriptors: (*Instrument dials, Geometric forms), Aircraft, Instrument panels, Visual perception, Effectiveness.

Identifiers: Legibility.

Comparisons were made of five dials of different shapes, all in common use for certain purposes. It was the aim of the study to determine the relative legibility of these several differently shaped dials. (Author)

AD-639 384 **Field 5H, 17I, 5E**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Jamestown, R. I. Systems Research Field Lab.
THE RELATIVE EFFICIENCY OF A BEARING COUNTER AND BEARING DIAL FOR USE WITH PPI PRESENTATIONS.
Memorandum rept.
by A. Chapanis. 1 Aug 47, 23p
Contract N5-ori-166 (01)
SPECDEVCEN-166-1-26

Descriptors: (*Plan position indicators, Counting methods), Direction finding, Range finding, Operation, Effectiveness, Performance (Human), Design, Human engineering, Radar operators.

A direct-reading bearing counter was constructed and mounted on a VJ remote radar indicator so that this method of exhibiting the bearing of targets could be compared with that of the bearing dial

normally used for the purpose. An experimental placement of the range counters, above the PPI and directly to the right of the bearing counter, was also tested. The first experiment measured the speed and accuracy with which radar operators can locate a target appearing on the PPI, adjust the bearing cursor and movable range rings to the position of the target, and read the bearing and range of the target from each of four different combinations of the bearing counter, bearing dial, and two range counters. The results show that, on the average, an operator can perform this sequence of operations 1.7 seconds (13.3 per cent) faster per target when he reads bearings from the counter rather than from the dial. The second experiment compared the bearing counter and dial in terms of the speed with which settings could be reproduced on the two types of indicators. The bearing dial proved to be superior to the counter for this type of operation. These experiments indicate that a direct-reading counter is more efficient than an annular scale for presenting bearing information which must be read from an instrument. The counter-type indicator, however, is less efficient if settings must be reproduced or set into the equipment. (Author)

N66-24965 **Field 5H**
CFSTI Prices HC$7.00 MF$1.75
Honeywell, Inc., Minneapolis, Minn.
MAN SYSTEM CRITERIA FOR EXTRATERRESTRIAL SURFACE ROVING VEHICLES INTERIM TECHNICAL REPORT.
by J. E. Haaland, and R. M. Nicholson. 7 Feb 66, 342p NASA-CR-74743
Contract NAS8-20006
Its Rept.-12504-itri

Descriptors: Crew, Criterion, Exploration, Extraterrestrial, Guidance, Infrared, Lrv, Lunar, *Lunar roving vehicle (lrv), Man-machine, *Man-machine system, Monitor, Recording, Roving, Simulator, Space, *Space exploration, Surface, System, Vehicle.

For abstract, see S 04 13.

N66-35213 **Field 5H**
CFSTI Prices HC$3.00 MF$1.00
Stanford Univ., Calif.
EFFECTS OF TIME DELAY IN THE VISUAL FEEDBACK LOOP OF A MAN-MACHINE SYSTEM.
by Leslie M. J., Sep 66, 121p NASA-CR-560
Grant NSG-111-61

Descriptors: Auditory, *Auditory perception, Control, Degradation, Delay, Feedback, *Feedback control system, Machine, Man, *Man-machine system, Operator, Perception, Performance, Sensory, *Sensory feedback, System, Time, *Time delay, Tracking, Visual.

For abstract, see S 04 20.

AD-638 853 **See Field 5J**

AD-639 029 **See Field 5E**

AD-639 126 **See Field 15D**

AD-639 167 **See Field 9B**

AD-639 287 **See Field 5J**

AD-639 323 **See Field 5G**

AD-639 367 **See Field 17I**

AD-639 369 **See Field 5E**

AD-639 376 **See Field 17I**

PB-170 836 **See Field 17B**

5I. PERSONNEL SELECTION, TRAINING, AND EVALUATION

AD-638 720 **Field 5I**
CFSTI Prices: HC$3.00 MF$0.75
Naval Personnel Research Activity, San Diego, Calif.
THE PROJECTED EFFECT OF AUTOMATION ON FUTURE NAVY PERSONNEL REQUIREMENTS. PART II: IMPLICATIONS FOR THE NAVY'S ENVIRONMENT, THE NATION.
Final rept.
by Irving E. Kaplan. Aug 66, 66p SRM-67-3
Proj. PF-016020401
See also AD-638 721.

Descriptors: (*Naval personnel, Automation), Military requirements, Electronic equipment, Costs, Reliability, Cybernetics, Computers, Navy.

The single technological contemporary contribution which will have the greatest effect on the contemporary civilization is the microelectronic revolution. Microelectronic techniques will result in electronic systems and equipments which will be much smaller, will use less power, will be extremely reliable and maintainable, will be producible by automated methods and will therefore be very inexpensive. The great reliability and very low cost of microelectronic circuitry will lower the costs of commercial and industrial computers to a point at which industry will find it competitively necessary to automate. Since any process which can be systematized, however loosely, is subject to cybernetic control and since the pressure of competition will force industry to do so, it is anticipated that most of industry will be automated within a short time. A time frame for the industrial changeover to automation is presented. The broad implications of automation for industry, the economy, the individual, the culture, and education as they will affect the Navy are discussed. (Author)

AD-638 721 **Field 5I**
CFSTI Prices: HC$1.00 MF$0.50
Naval Personnel Research Activity, San Diego, Calif.
THE PROJECTED EFFECT OF AUTOMATION ON FUTURE NAVY PERSONNEL REQUIREMENTS. PART I: SPECIFIC IMPLICATIONS FOR THE PERSONNEL STRUCTURE.
Final rept.
by Irving E. Kaplan. Aug 66, 25p SRM-67-3
Proj. PF-016020401

Descriptors: (*Naval personnel, Automation), Military requirements, Personnel management.

The report presents implications of industrial and naval automation for the Navy's human element. Consideration is given to the imminent possibility that the Navy will be required to provide a place for many personnel who cannot find employment in civilian industry, and discussion is also provided on the later problem of the automated society as a source of naval manpower. The qualitative personnel requirements of a 'fully' automated Navy are discussed and the manpower requirements of such a Navy are estimated in tabular form. A projected schedule for the advent of naval automation is omitted as the variables involved are too difficult to predict with any acceptable degree of validity. (Author)

AD-638 805 **Field 5I, 15G**
CFSTI Prices: HC$2.00 MF$0.50
Naval Personnel Program Support Activity, Washington, D. C. Personnel Research Lab.
QUALIFICATIONS AND RELATED TRAINING FOR NAVAL RESERVE OFFICERS (1105) NAVAL WARFARE/OPERATIONS, SURFACE. MINE WARFARE.
by Charles A. Hart. Sep 66, 37p WRM-67-4
Proj. PF017010201

Descriptors: (*Officer personnel, Naval training), (*Mine warfare, *Naval training), Military requirements.

The memorandum reports on the development of qualifications standards and related training for all 1105 officers assigned to the Mine Warfare (M/W) Program. These qualifications standards were developed as a part of the professional development system for Naval Reserve officers not on active duty. It should be noted that the Mine Warfare (M/W) qualifications outlined are in addition to the requirements for all 1105 officers outlined in NAVPERS 15988-1. The conclusion reached was that the addition of type warfare qualifications Mine Warfare (M/W) is a logical step of professional training in the professional development system. (Author)

AD-638 891 **Field 5I, 18E**
CFSTI Prices: HC$3.00 MF$0.50
Naval Personnel Research Activity, San Diego, Calif.
COMPUTERIZED TRAINING INPUT PLAN FOR NUCLEAR POWERPLANT OPERATORS.
Research rept.
by Richard D. Conner, and R. L. Colvin. Jun 66, 54p SRR-66-22
Proj. PF016010904

Descriptors: (*Programmed instruction, Nuclear engineering), (*Nuclear power plants, Operators (Personnel)), Naval personnel, Teaching methods, Computers.

The report describes the development and application of a computerized model for planning a continuous, sufficient input to the Basic Nuclear Power School, Class C. The Navy Enlisted Classification (NEC) code assigned to personnel designated for this school is 9901; hence, this model is referred to as the '9901 planning model.' This model considers four different sources of student input, and their associated attrition rates, and programs the personnel into the school over a period of 22 calendar quarters (66 months). The model, which automates all aspects of the 9901 planning procedures, will not only relieve the present computational burden and eliminate calculation errors, but also will provide results earlier in the planning period, thus permitting the testing of many more policy alternatives than is possible under current procedures. (Author)

AD-638 892 **Field 5I, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Naval Weapons Lab., Dahlgren, Va.
COMPUTER ASSISTED INSTRUCTION: A SELECTED BIBLIOGRAPHY AND KWIC INDEX.
Technical memo.
by Gerald L. Engel, and Wade J. Temple. Aug 66, 48p K-49/66

Descriptors: (*Programmed instruction, Computers), Indexes, Bibliographies.

Identifiers: KWIC index.

AD-639 030 **Field 5I, 15G**
CFSTI Prices: HC$4.60 MF$0.50
Naval Training Device Center, Port Washington, N. Y.
UTILIZATION STUDY OF MANEUVERING TACTICS TRAINER, DEVICE 1-BZ-2.
by Raold Bowers. 15 Sep 52, 48p
SPECDEVCEN-20-A-10
NAVEXOS-P-1060

Descriptors: (*Training devices, *Armed forces maneuvers), Military tactics, Officer personnel, Analysis, Learning, Military training.

The utilization study of the Maneuvering Tactics Trainer, Device 1-BZ-2, was undertaken for two basic purposes: (1) To examine its utilization and, if possible, to recommend additional uses or new instructional procedures which would improve its utilization. (2) To develop procedures for reviewing the utilization of other tactical trainers.

The device is suited for training experienced destroyer officers, junior officers, and officer candidates or inexperienced officers. Enlisted talkers and helmsmen can also be trained effectively on the device. (Author)

AD-639 033 **Field 5I, 5J**
Not available from CFSTI.
Ohio State Univ., Columbus. Dept. of Psychology.
DEVELOPMENT AND APPRAISAL OF DEVICES PROVIDING IMMEDIATE AUTOMATIC SCORING OF OBJECTIVE TESTS AND CONCOMITANT SELF-INSTRUCTION.
by S. L. Pressey. 2 Feb 50, 31p
Contract N6ori-017 (01)
SPECDEVCEN-17-1-1
Availability: Published in Journal of Psychology v29 p417-47 1950.

Descriptors: (*Teaching methods, *Tests), Learning, Students, Errors, Education.

Four major conclusions appear to stand out from the total investigation: (1) It has demonstrated a simple way to telescope into one single simultaneous process the taking of a test, the scoring of it, the informing of students as to their errors, and their guidance to the finding of the right answers. (2) It has shown that such a telescoped testing process, which informs each student immediately as he answers each question whether his answer is correct, and guides him to the right answer when he is wrong, does indeed transform test-taking into a form of systematically directed self-instruction. (3) It has shown that when the self-instructional tests were used systematically in college courses as an integral part of the teaching method, gains were substantial, and sufficiently generalized to improve understanding of a topic as a whole--even help on related topics. (4) It has shown that there are various promising means for automatic scoring and self-instruction.

AD-639 034 **Field 5I**
CFSTI Prices: HC$1.00 MF$0.50
Naval Training Device Center, Port Washington, N. Y.
LIST OF REPORTS AND SUMMARIES OF RESULTS OF RESEARCH ON INSTRUCTIONAL FILMS.
Feb 57, 14p SPECDEVCEN-269-7-61-Vol-2
NAVEXOS-P-1543

Descriptors: (*Training films, Scientific research), Indexes, Bibliographies, Military training.

The research was conducted to discover how to improve films and how to promote their use as an effective instructional device.

AD-639 035 **Field 5I**
CFSTI Prices: HC$1.60 MF$0.50
Tufts Univ., Medford, Mass. Inst. for Psychological Research.
LEARNING STUDIES WITH THE MARK 18 COORDINATION TRAINER DEVICE 3-A-40.
Interim rept.
by Mason N. Crook. 1 Apr 51, 16p
Contract N5ori-058 (01)
Proj. 20-C-1
SPECDEVCEN-58-1-1

Descriptors: (*Training devices, *Learning), (*Tracking, Training devices), (*Range finding, Training devices), Effectiveness, Images, Targets, Military training.

A satisfactory evaluation of the training effectiveness of the Mark 18 Coordination Trainer was delayed by various defects of design and construction. The work to date therefore consisted largely of modifications and improvements. The model has now been brought to a stage at which certain aspects of the learning process can be studied. Learning studies have begun. It would be desirable to make additional comparisons of training techniques requiring more precise adjustment of operating conditions, especially at the higher levels of difficulty, than the model now permits. Methods are in sight for making the further improvements that would be necessary for this purpose, and it is believed that the device can eventually be brought to a high level of effectiveness. Such further improvements would amount in effect to the development of a new model. (Author)

AD-639 036 **Field 5I, 19E**
CFSTI Prices: HC$1.00 MF$0.50
Tufts Univ., Medford, Mass. Inst. for Psychological Research.
RANGING TRACKING AIMING POINT ASSESSOR.
Interim rept.
Apr 51, 16p
Contract N5ori-058 (01)
SPECDEVCEN-58-1-3

Descriptors: (*Gunnery trainers, Effectiveness), Range finding, Target discrimination, Tracking, Performance (Human), Errors.

AD-639 037 **Field 5I, 17H**
CFSTI Prices: HC$1.00 MF$0.50
Tufts Coll., Medford, Mass. Inst. for Psychological Research.
REPORT OF RECOMMENDATIONS FOR THE MARK 18 COORDINATION TRAINER DEVICE 3-A-40.
by Mason N. Crook. Apr 52, 23p
Contract N5ori-058 (01)
Proj. 20-C-1
SPECDEVCEN-58-1-4

Descriptors: (*Optical tracking, *Training devices), Target discrimination, Range finding, Performance (Engineering), Learning, Effectiveness, Standards.

The report consists of recommendations for an improved model of the Coordination Trainer 3-A40 and a discussion of the detailed considerations on which such recommendations rest. A condensed list of recommendations is given, and problems and suggested solutions are discussed at length in relation to general functional standards.

AD-639 038 **Field 5I, 19E**
CFSTI Prices: HC$2.00 MF$0.50
Tufts Coll., Medford, Mass. Inst. for Applied Experimental Psychology.
RANGING TRACKING AIMING POINT ASSESSOR DEVICE 3-E-7.
Final rept.
by Robert M. Gottsdanker, and John C. Armington. 1951, 29p
Contract N5ori-058 (01)
SPECDEVCEN-58-1-5
See also AD-639 036.

Descriptors: (*Gunnery trainers, Effectiveness), Range finding, Target discrimination, Tracking, Performance (Human), Errors, Gun sights, Azimuth, Aptitude tests.

The assessor was intended for use in connection with a variety of problems in the operation of gunsight systems. A great deal of time was spent in attempting to make the device operate in a satisfactory manner. However, there proved to be basic weaknesses of design and construction which prevented accurate measurement. A study was finally undertaken using the Martin Electric Upper Deck and the Mark 18 Mod 4 Sight. Three subjects were given ten hours of training apiece over a period of 24 days. Azimuth error of gun pointing was reduced to a minimum after about the third hour. The time required to reach minimum ranging error differed for the three subjects, varying between three and eight hours. For elevation error of gun pointing the subjects appeared to be still improving at the end of the ten hours. Individual differences were noted, one of the subjects showing consistently better performance than the other two in regard to the azimuth aspect of gun pointing and ranging. Most of the constant error of gun pointing was in the direction of lagging behind the target. Quite consistent trends in the change of constant error were noticed for each of the subjects. These trends helped clarify the changes of average error. Continuous error curves for sample courses were examined. Some rather regular patterns appeared. The time required for a typical cycle of adjustment of error was between two and four seconds for gun pointing. Even slower adjustments of ranging error were found. (Author)

AD-639 039 **Field 5I**
CFSTI Prices: HC$1.00 MF$0.50
Tufts Coll., Medford, Mass. Inst. for Applied Experimental Psychology.
EVALUATION OF GUNNERY TRAINING DEVICES - DEVICES 3-E-7 AND 3-A-40.
Technical rept.
1 Apr 50, 8p
Contract N5ori-058 (01)
Proj. NR-782-001
SPECDEVCEN-58-1-6

Descriptors: (*Gunnery trainers, Effectiveness), Range finding, Optical tracking, Target discrimination, Aptitude tests, Performance (Human), Learning, Motivation.

AD-639 055 **Field 5I**
CFSTI Prices: HC$6.60 MF$0.75
Psychological Corp., New York.
THE SPECIAL DEVICES USED IN THE PENSACOLA PILOT CANDIDATE SELECTION RESEARCH PROGRAM.
by Walter R. Mahler. 1 Feb 48, 69p
Contract N6ori-151 (01)
Proj. 20-A-2
SPECDEVCEN-151-1-10

Descriptors: (*Pilots, Selection), (*Training devices, Effectiveness), Naval training, Naval personnel.

Three Cycloramic Links, three 12 BK Trainers, and an Orientator were erected in Hangar 380 at Pensacola, to be evaluated in the selection and training of Naval Air Cadets.

AD-639 085 **Field 5I, 17B**
CFSTI Prices: HC$1.00 MF$0.50
Purdue Research Foundation, Lafayette, Ind.
RETENTION OF VOICE COMMUNICATION TRAINING AFTER ONE YEAR.
Technical rept.
by J. C. Kelly. 5 Mar 49, 15p
Contract N6ori-104 (02)
Projs. 20-K-1, NR-782-003
SPECDEVCEN-104-2-13

Descriptors: (*Voice communication systems, Training), (*Training, Retention), Performance tests.

Subjects who had previously been trained in voice communication using telephone equipment were tested one year later to determine whether they retained the skill. The following results were obtained: (1) Trained subjects made higher scores than did control subjects. Training had consisted of two hours of instruction and practice. (2) Performance on communication equipment one year after training was essentially as good as it had been immediately after completion of the training. The following conclusions seem warranted: (1) Effects of voice communication training endure for a period of at least one year. (2) Improvement incidental to test-taking as evinced by the control group, is also retained; however this skill remains inferior. (Author)

AD-639 098 **Field 5I, 17B**
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
INTENSITY MONITORING PERFORMANCE AS A FUNCTION OF TRAINING.
Technical rept.
by Bernard Spilka, R. C. Bilger, and M. D. Steer.

28 Oct 54, 17p
Contract N6ori-104 (02)
Proj. 20-F-8
SPECDEVCEN-104-2-31

Descriptors: (*Voice communication systems, Auditory perception), (*Military training, *Auditory perception), Intensity, Performance tests, Speech.

Ten subjects monitored five speech samples at five different levels of intensity. Each subject was required to watch the Volume Unit (VU) meter, listen to the spoken material and set an average level for recording what was heard. Five of the subjects had considerable experience with audio equipment and formed the trained group; the other five subjects had no familiarity with sound recording instruments and formed the untrained group. There were no differences in the monitoring of vocal intensity between the trained and untrained groups with respect to Mean Performance level and variability. Training did not affect performance scores at the different intensity levels. Performance scores on different reading passages were significantly different for the trained and untrained groups. The trained group was less variable than the untrained group from one passage to another. (Author)

AD-639 105 **Field 5I, 17B**
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
EVALUATION OF A SIGNAL LEVEL MONITORING METER AS A COMPONENT IN A VOICE COMMUNICATION TRAINING DEVICE.
Technical rept.
by J. W. Asher, L. A. Doty, T. D. Hanley, and M. D. Steer. 31 Mar 56, 15p
Contract N6ori-104 (02)
Proj. 20-F-8
SPECDEVCEN-104-2-47

Descriptors: (*Voice communication systems, *Training devices), (*Speech, *Intelligibility), Sound signals, Meters, Monitors, Military training, Effectiveness, Magnetic recording systems.

The major findings are summarized as follows: (1) Where training was given by tape-recorded directions, there was a marked improvement in speech intelligibility over the condition in which no training was given. (2) Greater improvement in speech intelligibility resulted when the intensity monitoring device was included in the training period. (Author)

AD-639 127 **Field 5I**
CFSTI Prices: HC$1.00 MF$0.50
Research Analysis Corp., McLean, Va.
A COMPUTER MODEL FOR PROJECTING CIVILIAN AND MILITARY MANPOWER.
by Harvey B. Safeer, Gilbert Bernstein, and Stephen R. Wax. Nov 65, 18p RAC-P-13

Descriptors: (*Manpower studies, Computers), (*Military personnel, Manpower studies), (*Civilian personnel, Manpower studies), Recruiting, Personnel management.

A study was made to develop a model that will reflect the impact of changes in civilian-military manpower policy on military strength and costs and on the civilian manpower pools; to implement the model as a computer program that would increase significantly over existing methods the scope of alternatives that could be considered in a relatively short period of time; and to develop relations between policy alternatives and military strength and cost parameters that would accurately reflect the impact of policy changes. The purpose of the military-civilian manpower projection model is to provide a means for the rapid assessment of the impact of alternative civilian-military manpower policies on military strengths and costs and civilian manpower pools. The model considers not only the gross manpower strength implications but also the interface between military manpower policies and civilian manpower policies. (Author)

AD-639 141 **Field 5I, 5J**
CFSTI Prices: HC$1.00 MF$0.50
School of Aerospace Medicine, Brooks AFB, Tex.
AN EXPLORATORY STUDY OF FACTORS AFFECTING AIRCREW MORALE.
by Bryce C. Hartman, George K. Cantrell, and Lewis S. Sims. May 66, 13p SAM-TR-66-62
Task 793003

Descriptors: (*Flight crews, Attitudes), Motivation, Air force personnel, Personnel management.

Aircrew morale was studied in 176 MAC aircrewmen. In interviews and questionnaires, nine problem areas were identified. The primary problem reported by the aircrewmen was lack of planned free time. This factor had a negative effect both on duty and off duty. The remaining eight factors were more specific to the working environment. Several were a function of the mission of the command but some were accessible to local modification. In the face of these problems, aircrewmen maintained good motivation, probably because of the satisfactions obtained from flying and from other aspects of their Air Force careers. (Author)

AD-639 142 **Field 5I, 5J**
CFSTI Prices: HC$1.00 MF$0.50
Mount Holyoke Coll., South Hadley, Mass. Psychophysical Research Unit.
THE EFFECT OF A SIMPLE TRAINING PROCEDURE ON THE JUDGMENT OF VISUAL NUMBER.
Technical rept.
by E. L. Kaufman. Sep 51, 15p
Contract Nonr-131 (01)
Projs. NR-784-001, 20-L-2
SPECDEVCEN-131-1-1

Descriptors: (*Numbers, Counting methods), (*Counting methods, *Training), Visual signals, Visual perception.

Conclusions: Accuracy of judging number can be improved by a simple training procedure. The effect of this training upon accuracy is almost immediate. Most of the possible improvement is made after a very short training period. Training improves the estimates of both those individuals who tend to overestimate and those who tend to underestimate number. After a period as long as eight months without further practice or training, people still judge number more accurately than before training. The effects of training seem to last for a relatively long time. (Author)

AD-639 165 **Field 5I**
CFSTI Prices: HC$3.00 MF$0.75
Naval Personnel Program Support Activity, Washington, D. C. Personnel Research Lab.
JOB EVALUATION: A STUDY OF SELECTED SYSTEMS AND THEIR APPLICATION TO NAVY ENLISTED BILLETS.
Progress rept.
by Alexander J. Rose. Sep 66, 74p WRM-67-3
Proj. PF-016010701

Descriptors: (*Job analysis, *Navy), Naval personnel, Personnel management, Civilian personnel, Industries.

Identifiers: Evaluation.

The report presents an assessment of selected military, industrial, and government job evaluation systems and their possible application to the design of a Navy billet evaluation system. The report concludes that, while certain features of the job evaluation systems studied are applicable to the Navy, there are no existing systems that meet the requirements or fit the circumstances of the Navy work situation. A billet evaluation system for the Navy must be tailored specifically to Navy work (Author)

AD-639 225 **Field 5I, 5J**
CFSTI Prices: HC$1.00 MF$0.50
Naval Personnel Research Activity, San Diego Calif.
PROMPTING VS FEEDBACK IN TRAINING AUDITORY JUDGMENTS OF VARYING DIFFICULTY.
Technical bulletin.
by E. G. Aiken. Aug 66, 17p STB-67-5
Proj. PF017031001

Descriptors: (*Pitch discrimination, *Training), Feedback, Auditory perception, Naval training, Teaching methods, Intensity, Identification, Doppler systems.

Two training procedures were compared for their efficiency in training two auditory judgments. One procedure (prompting) involved presentation of the correct answer before the presentation of the stimulus. The other procedure (feedback) involved presentation of the correct answer after the subjects had judged the stimulus. Results indicate: (1) A substantial trend toward superiority of feedback in improving pitch discrimination performance at two levels of difficulty, (2) a trend toward superiority of prompting in the training of pitch and intensity identification, (3) a substantial trend toward greater transfer to a Doppler discrimination problem following auditory identification as opposed to auditory discrimination training. Recommendations are made concerning implications of the data for Navy training and future research. (Author)

AD-639 237 **Field 5I, 5J**
CFSTI Prices: HC$1.00 MF$0.50
Personnel Research Lab., Lackland AFB, Tex.
DEVELOPMENT OF OFFICER SELECTION AND CLASSIFICATION TESTS-1966.
by Robert E. Miller. Jun 66, 19p PRL-TR-66-5
Proj. AF-7717
Task 771706

Descriptors: (*Officer personnel, Selection), Test construction (Psychology), Performance tests, Aptitude tests, Air force personnel, Standardization, Correlation techniques, Reliability.

Identifiers: TALENT project.

Two new tests for use at the officer and student officer level were constructed for implementation is fiscal year 1966. These are the Air Force Officer Qualifying Test-66 (AFOQT) and the AFROTC Pre-Enrollment Test-66 (PET). The former succeeds AFOQT-64 in the normal two-year replacement cycle and closely resembles AFOQT-64 in format, type of content, and procedures for construction and standardization. It yields Pilot, Navigator-Technical, Officer Quality, Verbal, and Quantitative composite scores. Standardization was accomplished with reference to the Project TALENT battery in a manner which permits relating scores on the new test form to performance of Air Force Academy candidates and 12th grade males. A similar procedure was used in standardizing AFROTC PET-66. This test is an adaptation of the former Precommission Screening Test-62. It yields a total score based on verbal and quantitative items. It is intended as a screening device for college freshmen who apply for the AFROTC program. (Author)

AD-639 238 **Field 5I, 5J**
CFSTI Prices: HC$1.00 MF$0.50
Personnel Research Lab., Lackland AFB, Tex.
COMPARISON OF THE AIRMAN QUALIFYING EXAMINATION WITH THE DIFFERENTIAL APTITUDE TESTS.
by Howard L. Madden, Lonnie D. Valentine Jr., and Ernest C. Tupes. Jul 66, 21p PRL-TR-66-7
Proj. AF-7719
Task 771906

Descriptors: (*Air force personnel, Selection), (*Psychometrics, Air force personnel), Aptitude tests, Recruiting, Correlation techniques.

In the high school testing program of the USAF Recruiting Service, there is occasional reference to the relationship between the Airman Qualifying Examination and civilian tests. Information in this area can be useful in the hands of guidance counselors. This report contains data on the relationships between the Differential Aptitude Tests and the Airman Qualifying Examination. Tables are presented which can be used to estimate DAT scores from the AQE aptitude indexes or to estimate AQE aptitude indexes from DAT scores. It appears that the AQE and DAT measure essentially similar abilities. (Author)

AD-639 275 **Field 5I, 19E**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ., Iowa City.
AN EXPERIMENTAL STUDY OF THE EFFECTIVENESS OF VARIOUS TRAINING PROCEDURES USED WITH THE AERIAL GUNNERY TRAINING DEVICES 3-A-35 AND 3-A-2.
by E. B. Knauft, and C. E. Buxton. 3 Jul 46, 12p
Rept. no. 2
Contract N5ori-057 (01)
Proj. 20-B-1
Task 2
SPECDEVCEN-57-1-1

Descriptors: (*Aerial gunnery, *Training devices), (*Training, Effectiveness), (*Gunnery trainers, Teaching methods), Learning.

The experiment is concerned with the problem of determining the optimum training method to be employed with the 3-A-35 device, assuming that this trainer has face validity as an aerial gunnery trainer. The quantitative data do not indicate that any one of five training methods is superior to the other methods, mainly because of the large variability of scores from gunner to gunner on any one training method. Qualitative data indicate that under the present experimental conditions the majority of subjects preferred the 3-A-35 condition and the 3-A-35 accompanied with 'on-target' lights. The learning data indicate that subjects can improve significantly with practice on this equipment. Although the ceiling on the 3-A-2 appears to be reached early in training, there is a possibility that further training on the more complex methods, especially 3-A-35 with on-target lights, might result in a higher final level of performance. The reliability of the percent hits scores obtained is probably satisfactory. (Author)

AD-639 278 **Field 5I**
CFSTI Prices: HC$1.10 MF$0.50
Iowa State Univ., Iowa City.
MEMORANDUM ON THE USE OF THE CORRECT POINT-OF-AIM IN GUNNERY TRAINING DEVICES.
by E. B. Knauft. Oct 46, 10p
Contract N5ori-057 (01)
Proj. 20-B-1
SPECDEVCEN-57-1-4

Descriptors: (*Gunnery trainers, Performance (Human)), Operation, Aerial gunnery, Learning, Military training.

Conclusions: Gunners should be trained on a large number of different attacks in a given quadrant or sector. The repeated use of the same attacks for a given gunner results in the learning of highly specific responses to given situations (attacks) at the expense of learning the general principles and operations of leading. The point-of-aim should be continuously visible to the gunner when he is first presented with new attacks. Insufficient evidence and experience with the various methods of presenting the point-of-aim make it impossible to recommend any one method as being the most efficient for training after the first few sessions. (Author)

AD-639 342 **Field 5I, 1B, 6S**
CFSTI Prices: HC$1.00 MF$0.50
Army Aeromedical Research Unit, Fort Rucker, Ala.
PHYSIOLOGICAL TRAINING OF HALO PARACHUTISTS.
by W. P. Schane. Sep 66, 23p USAARU-67-2
Proj. DA-3AO-2560-1A-819
Task 3AO-2560-1A-819-038

Descriptors: (*Parachute jumping, *Training), High altitude, Stress (Physiology), Aviation medicine.

Identifiers: HALO parachutists.

The report reviews the environment in which a HALO parachutist operates, indicates some areas in training which deserve special attention, and makes some specific operational recommendations which, if adopted, would reduce the possibility of injury or disease caused by the man-environment interaction. (Author)

AD-639 611 **Field 5I, 5K**
CFSTI Prices: HC$2.00 MF$0.50
Human Resources Research Office, George Washington Univ., Alexandria, Va.
AN ANALYSIS OF HUMAN RELATIONS TRAINING AND ITS IMPLICATIONS FOR OVERSEAS PERFORMANCE.
Technical rept.
by Robert J. Foster, and Jack Danielian. Aug 66, 43p TR-66-15
Contract DA-44-188-ARO-2
Proj. DA-2J024701A712-01

Descriptors: (*Military training, *Social communication), (*Military personnel, Attitudes), Behavior, Culture, Performance (Human), Teaching methods, Learning, Social sciences.

Identifiers: Cross culture (Sociology).

Evidence indicates that the nature of overseas work requires an increased emphasis on the people-related functions of job performance. The importance of these functions is further accentuated by the contrast between American and non-American values, assumptions, and perceptions, upon which effective communications and interpersonal behavior depend. Existing knowledge and experience in human relations training is reviewed in order to determine its relevance to preparing personnel for the cross-cultural aspects of overseas assignments. The training techniques of training groups (T-groups), role-playing, and case study are examined. Each is treated with respect to (1) a general description, (2) evidence as to its effectiveness, (3) its applications in area training, and (4) possible modifications for its use in training people for overseas work. (Author)

N66-25011 **Field 5I**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
THE FUNCTION OF DESIGN IN AN ADVANCED TECHNOLOGY INDUSTRY.
by W. J. Schimandle. 27 Aug 62, 23p NASA-CR-74846, JPL-TM-33-101
Contract NAS7-100

Descriptors: Advance, Behavior, Design, Development, Education, *Engineering (gen), Human, *Human behavior, Industry, Learning, *Technology, *Training.

For abstract, see S 04 13.

PB-170 729 **Field 5I**
CFSTI Prices: HC$2.60 MF$0.50
Yale Univ., New Haven, Conn. Dept. of History of Science and Medicine.
THE PRODUCTIVITY OF SCIENTISTS: A PRELUDE TO MANPOWER STUDIES.
by John P. Britton. 1 Nov 64, 30p
Grant NSF-GN-299
NSF Scientific Documentation Project.

Descriptors: (*Scientific personnel, Scientific research), (*Reports, Production), Distribution, Probability, Mathematical prediction, Manpower studies.

Previous studies have yielded distributions of productions among scientists which are shown to be incomplete versions of a general complete production distribution. The correction for completeness is found to affect the high producers most markedly and preserves the large proportion of low producers found in earlier studies. The complete-production distribution function is used to determine the probability of an author producing a given number of papers as well as his expected production of any group of scientists can be estimated from their past production. (Author)

PB-173 105 **Field 5I, 11L, 5C**
CFSTI Prices: HC$6.00 MF$1.50
New Hampshire Univ., Durham. Agricultural Experiment Station.
A STUDY TO DETERMINE MEANS OF REDUCING UNEMPLOYMENT AND UNDEREMPLOYMENT IN GRAFTON, COOS, AND CARROLL COUNTIES, NEW HAMPSHIRE THROUGH INCREASED UTILIZATION OF HARDWOODS GROWING ABUNDANTLY IN THE AREA FOR THE MANUFACTURE OF PRODUCTS OTHER THAN PULP AND PAPER.
by Paul H. Graham, and George W. Shaw. May 66, 292p
Contract Cc-6168
Proj. 570
Availability: Original document in color until exhausted.

Descriptors: (*New Hampshire, Employment), (*Employment, New Hampshire), (*Wood, Industries), Processing, Economics, Industrial production, Forestry, Management engineering, Labor.

It is estimated that implementation of wood products and plant recommendations could provide employment for about 1,000 workers, exclusive of logging, transportation and other trade and service industry employees serving these wood-using industries which could increase this number of workers to 1,500. Raw material requirements will permit the use of as much as 60 per cent of the lower hardwood grades for maximum utilization of the forest resources and salvage products will reduce the unprofitable volume of logging and manufacturing waste. The shortage of skilled labor is a major problem. It is recommended that these three northern counties take advantage of aid now being provided by the State and Federal Government to establish suitable manpower training programs tailored to meet requirements of these wood-using industries and take whatever steps may be required to provide educational and training programs which could supply qualified managerial and supervisory personnel for the future. (Author)

AD-639 084 See Field 17B

AD-639 088 See Field 17B

AD-639 089 See Field 5J

AD-639 095 See Field 17B

AD-639 096 See Field 17B

AD-639 097 See Field 17B

AD-639 099 See Field 17B

AD-639 106 See Field 17B

AD-639 107 See Field 5J

AD-639 276 See Field 5J

AD-639 277 See Field 5J

AD-639 273 See Field 5J

AD-639 402 See Field 6E

AD-639 618 See Field 17B

5J. PSYCHOLOGY (INDIVIDUAL AND GROUP BEHAVIOR)

AD-638 718 **Field 5J, 6P**
CFSTI Prices: HC$1.00 MF$0.50
Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
A SELECTIVE REVIEW OF THE LITERATURE ON TACTILE SENSITIVITY: 1940-1965.
Final rept., Oct-Dec 65
by Thomas J. Moore. Apr 66, 24p AMRL-TR-66-50
Proj. AF-7232
Task 723202

Descriptors: (*Touch, *Communication systems), Skin, Psychophysiology, Nervous system, Auditory perception, Physiology, State-of-the-art reviews.

The literature from 1940 to 1965 concerned with the tactile sense has been selectively reviewed. The neurophysiological, psychophysiological, and communicatory aspects of the tactile system were considered. In each of the three areas, representative studies have been reviewed and current trends of research have been indicated. (Author)

AD-638 724 **Field 5J**
CFSTI Prices: HC$2.00 MF$0.50
Human Resources Research Office, George Washington Univ., Alexandria, Va.
A TENTATIVE ORGANIZATIONAL SCHEMA FOR DECISION-MAKING PROBLEMS.
Technical rept.
by William C. Osborn, and Barbara Ettinger Goodman. Jul 66, 29p TR-66-14
Contract DA-44-188-ARO-2
Proj. DA-2J024701A712-01

Descriptors: (*Decision making, Analysis), Psychology, Behavior, Probability.

To take into account the psychological complexity of most real-life decision problems, and to develop a tentative organization of decision behavior that will embrace the many, highly diverse types of problems which are presumed to result in 'decision,' an attempt was made to delineate the component response processes that lead to these decisions. The procedure followed was (a) to identify and descriptively define the relevant stimulus and organismic factors, and (b) especially to schematize the response dimensions involved, in such a way as to derive a tentative response matrix. The result is an organizational schema for use in analyzing the response aspects of the decision-making process in terms of the pertinent psychological dimensions of decision behavior. (Author)

AD-638 768 **Field 5J**
Not available from CFSTI.
California Univ., Berkeley.
WHOLE VERSUS PART LEARNING OF PAIRED-ASSOCIATE LISTS.
by Leo Postman, and Judith Goggin. 11 Feb 65, 11p
Contract Nonr-222 (90)
Proj. NR-154-230
Availability: Published in Journal of Experimental Psychology v71 n6 p867-77 1966.

Descriptors: (*Learning, Analysis of variance), Correlation techniques, Psychometrics.

The study reports 2 experiments comparing the whole and part methods of paired-associate learning. In Experiment I the pure-part method was used in which the acquisition of the individual parts is followed by a combination stage during which the entire list is learned. The difference between the 2 methods of practice was investigated as a function of interstimulus similarity and interresponse similarity. In spite of wide variations in list difficulty the difference in total learning time between the whole and part condition remained essentially invariant at or near 0. In Experiment II the whole, pure-part, and repetitive-part methods were compared. In the latter method early parts continue to be practiced as later ones are added. The total learning times were again equal for the whole and pure-part conditions but both were significantly inferior to the repetitive-part condition. (Author)

AD-638 769 **Field 5J, 6P**
Not available from CFSTI.
Columbia Univ., New York.
COMPENSATORY HUE SHIFT IN SIMULTANEOUS COLOR CONTRAST AS A FUNCTION OF SEPARATION BETWEEN INDUCING AND TEST FIELDS.
Technical rept.
by Yun Hsia, and Tadasu Oyama. 28 Oct 64, 10p TR-37
Contract Nonr-266 (46)
Proj. NR-142-404
Prepared in cooperation with Chiba Univ. (Japan).
Availability: Published in Journal of Experimental Psychology v71 n3 p405-13 1966.

Descriptors: (*Colors, *Visual perception), Monochromatic light, Separation, Color vision, Performance tests.

Each of 2 color-normal Ss was instructed to adjust a monochromator illuminating a foveally fixated 4 deg. circular test field to give a 'best' blue, green, and yellow in ascending and descending determinations; a red setting was obtained only in an ascending sequence, i.e., in order of increasing wavelength. Settings were made in the presence and absence of a 30 deg. circular surround (inducing field) of each of the same four colors. A compensatory shift in wavelength setting for the contrast-induced tinge occurred almost always in the direction of the inducing color; this trend was observed under varying conditions of separation between the inducing and test fields ranging from 0 to 8 deg. Over this entire range of separation, another trend was observed that the amount of shift decreased as the separation increased. (Author)

AD-638 773 **Field 5J**
Not available from CFSTI.
Georgia Univ., Athens.
STIMULUS FAMILIARIZATION (N) IN NONVERBAL SELECTIVE LEARNING.
Master's thesis.
by Clyde E. Noble, James P. Allison, and Thomas A. Jones. 1966, 2p
Contract Nonr-3677 (02), Grant AF-AFOSR-1099-66
Prepared in cooperation with Montana State Univ., Missoula.
Availability: Published in Psychon. Sci. v5 n12 p453-4 1966.

Descriptors: (*Learning, Psychometrics), Performance tests.

One-hundred sixty Ss practiced 10-choice 4-unit tasks on the Selective Mathometer for 40 noncorrection trials under one of 8 different experimental conditions. The stimuli were paralogs of low meaningfulness and familiarity on Noble's m and f scales, presented in a paired-associate fashion. The 8 matched groups of 20 Ss each were formed by 6 combinations of 3 levels of relevant stimulus familiarization and 2 kinds of criterion-task stimulus treatment plus 2 high-frequency irrelevant stimulus familiarization and articulation control conditions. There were large, significant practice effects but no main effects or interactions due to the other experimental conditions. The null results pose difficulties for theories of stimulus predifferentiation. (Author)

AD-638 785 **Field 5J**
Not available from CFSTI.
Antioch Coll., Yellow Springs, Ohio. Behavior Research Lab.
THE ELICITED OBSERVING RATE AND DECISION PROCESSES IN VIGILANCE.
by Harry J. Jerison, Ronald M. Pickett, and Herbert H. Stenson. Apr 65, 27p
Contract AF 33 (615)-1086, Grant AF-AFOSR-150-65
Proj. AF-7184
Task 718401
AMRL-TR-65-104
Availability: Published in Human Factors v7 n2 p107-28 Apr 1965.

Descriptors: (*Attention, Performance tests), (*Visual perception, Visual signals), Decision making, Detection, Probability.

Observers detected many more of a fixed number of signals when these were among stimuli presented at 5 per minute than when these were among stimuli presented at 30 or 60 per minute. The effect, which is associated with either the signal probability or the nonsignal stimulus density, is analyzed with conventional measures and with measures from the theory of signal detectability (TSD). The TSD measures were used to define several possible modes of observing, and the model of vigilance based on decisions about observing could then be related to decision processes in detection performance as considered by TSD. If a single measure of the probability of alert observing is required, the best one is the percentage of detections of the readily detectable signal of the vigilance task. However, the TSD analysis suggested various different 'mixes' of modes of observing for the subgroups in this experiment, and these mixes could be specified with the help of heuristic models relating performance measures to the probability of observing. (Author)

AD-638 853 **Field 5J, 9B, 5H**
CFSTI Prices: HC$2.00 MF$0.50
Western Management Science Inst., Univ. of California, Los Angeles.
COMPUTER SCIENCE DEVELOPMENTS RELEVANT TO PSYCHOLOGY.
by Earl B. Hunt. Aug 66, 37p WMSI Working Paper-104
Contract Nonr-233 (75)
Proj. NR-047-041
Prepared for presentation at Division 3 (Experimental Psychology) of the American Psychological Assoc., New York, Sep. 66.

Descriptors: (*Man-machine systems, Psychology), (*Psychology, *Computers), Real time.

The application of computers in Psychology can be divided into three broad areas: mathematical computation, file manipulation, and on-line control of experimentation. New languages and better computing techniques will make the first area of application much easier. One-line consoles permitting rapid access to the computer will largely replace the present day desk calculators used in many psychological data processing problems. The use of electronically stored files will make record searching and screening much easier. The most interesting new applications, however, will be in the area of on-line control of experiments by man-machine interaction. The developments in computer science which make these applications possible are discussed in some detail. In addition, there are conceptual developments in computer science, particularly in the study of artificial intelligence, which may provide leads in the development of psychological theory. (Author)

AD-638 890 **Field 5J**
Not available from CFSTI.
Navy Medical Neuropsychiatric Research Unit, San Diego, Calif.
THE PREDICTIVE VALIDITY OF CLINICAL RATINGS FOR AN EXTREME ENVIRONMENT.
Interim rept.
by E. K. Eric Gunderson, and E. L. Kapfer. 3 May 65, 12p Rept. no. 65-14

NAVMED-MR005.12-2004.1
Availability: Published in The British Journal of Psychiatry v112 n485 p405-12 Apr 1966.

Descriptors: (*Antarctic regions, Performance tests), (*Personality, Psychometrics), Adjustment (Psychology), Psychiatry, Stress (Psychology).

Approximately 600 Navy and scientist participants in seven expeditions of the U.S. Antarctic Research Program were examined independently by psychologists and psychiatrists and rated on personality trait scales. The clinical ratings were correlated with performance measures derived from evaluations by station supervisors and peers after approximately one year at an Antarctic scientific station. Assessment conditions varied in terms of methods of clinical appraisal (Rorschach and interview), amount of instruction given examiners, and variance in quality of performance. Validities were consistently non-significant for psychologists using Rorschach technique; both psychologists and psychiatrists achieved significant validities utilizing a flexible interview procedure, even though criterion variance was relatively small. Predictions were most effective when examiners recieved most information concerning assessment objectives and information concerning the Antarctic environment. (Author)

AD-638 896 **Field 5J**
CFSTI Prices: HC$3.00 MF$0.50
American Univ., Washington, D. C. Center for Research in Social Systems.
INFLUENCE IN INTERCULTURAL INTERACTION.
Technical rept.
by Anita Terauds, Richard Panman, and William A. Lybrand. Aug 66, 56p
Contract DA-49-092-ARO-7

Descriptors: (*Culture, *Social communication), Factor analysis.

Identifiers: Persuasive communications.

To determine which of several factors in intercultural influence attempts have been regularly associated with successful persuasion attempts and which with unsuccessful attempts, 345 incidents were selected from published accounts, coded, and analyzed through a modification of the critical incident technique. The data were discussed with reference to the need for a reexamination of some widespread premises upon which persuasion attempts in intercultural settings have been based. (Author)

AD-638 927 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Miami Univ., Oxford, Ohio.
REVISION OF A MATHEMATICALLY DEFINED TASK TO STUDY GROUP PERFORMANCE.
by Julian O. Morrissette, and Joseph Vannoy. Jun 66, 13p
Contract AF 33 (615)-2224
Proj. AF-7184
Task 718403
AMRL-TR-66-68

Descriptors: (*Group dynamics, *Social communication), Performance (Human), Information theory, Effectiveness, Psychometrics.

A mathematically defined task for the study of groups in communication networks is described. Two procedures were used to administer the task. In one procedure the number of decks of cards that had to be maintained to provide various orders within subjects and over subjects and problems made the administration of the task awkward, time comsuming, and fraught with possible sources of error. In the other procedure, a revision of the first, the task elements of the problems assigned to each subject were stamped in random locations on a 5 in. x 8 in. card, thus greatly simplifying the administration of the task. Intertrial time intervals were reduced from about 120 to about 20 seconds. Comparisons of data obtained from two experiments, one using the original procedure and the other the revised procedure, showed no significant procedural effects; both procedures produced the same results with respect to the effects of task difficulty and communication structure on group effectiveness. (Author)

AD-639 040 **Field 5J, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Tufts Univ., Medford, Mass. Inst. for Psychological Research.
REVIEW OF LITERATURE AND SOME PRELIMINARY RESULTS IN THE DEVELOPMENT OF AN ALERTNESS INDICATOR.
by Roland C. Travis, and John L. Kennedy. 5 Jun 46, 20p
Contract N5ori-058 (02)
Proj. 20-C-2
SPECDEVCEN-58-2-1

Descriptors: (*Attention, Monitors), Brain, Sleep, Muscles, Fatigue (Physiology), Eye, Motion, Reading, Relaxation (Physiology).

The survey of the literature is reviewed as to (1) the brain potentials in wakefulness and sleep and (2) muscle action potentials as diagnostic of degrees of alertness. Recording of muscle spikes in a pilot study was attained by use of a 3-channel Grass, resistance-capacitance coupled amplification system in conjunction with electronic counters. The studies concerned (1) the rectilinear relationship between electronic-muscle-spike-count and amount of tension applied to a muscle, (2) correlation between the electronic counts of specific counters, (3) correlation of electronic count in eye movements in blinking with the number of blinks recorded on an ink-writing oscillograph, and (4) the difference in counts between an attitude of reading and an attitude of voluntary relaxation.

AD-639 041 **Field 5J**
Not available from CFSTI.
Tufts Univ., Medford, Mass. Inst. for Psychological Research.
PREDICTION AND AUTOMATIC CONTROL OF ALERTNESS. I. CONTROL OF LOOKOUT ALERTNESS.
by Ronald C. Travis, and John L. Kennedy. 4 Aug 47, 5p
Contract N5ori-058 (02)
SPECDEVCEN-58-2-5
Availability: Published in The Journal of Comparative and Physiological Psychology v40 n6 p457-61 Dec 1947.

Descriptors: (*Attention, Control), Motor reactions, Automatic, Simulation, Monitors, Reflexes.

The report presents experimental results from the use of a new electronic accumulator in addition to amplifying and recording techniques. Data on a simulated lookout performance are presented.

AD-639 043 **Field 5J, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Tufts Coll., Medford, Mass. Inst. for Applied Experimental Psychology.
LABORATORY AND ROAD TESTS OF THE PORTABLE ALERTNESS INDICATOR.
Interim progress rept.
by John L. Kennedy, and Roland C. Travis. 1948
10p Rept. no. 4
Contract N5ori-058 (02)
SPECDEVCEN-58-2-8
See also AD-639 044.

Descriptors: (*Attention, Monitors), (*Motor vehicle operators, Performance (Human)), Portable, Tests, Calibration, Measurement.

The 0.23-cu ft, 8.5-lb portable model has a differential input circuit that makes possible the relatively undistorted pickup of biological products when the man is not in an electrostatically shielded location. The model requires 110 AC to insure a constant DC voltage source for the output circuit. To attain dependability in shielding out stray AC and electrostatic effects, a differential amplifier for the input stage and considerable feedback for the other stages were used. On field tests the indicator operated dependably whether or not the car's motor and radio were in operation. On operation along roads of varying roughness and under telephone and power lines, the gain settings necessary to trip the relay varied dependably for different tension levels (closing jaws, looking ahead and alert, eyes closed and relaxed. Since the gain of the alertness indicator can be set to trip the relay at any desired tension level, the subject may be warned automatically whenever his tension level or alertness status goes beyond a predetermined level.

AD-639 044 **Field 5J, 14B**
Not available from CFSTI.
Tufts Coll., Medford, Mass. Inst. for Applied Experimental Psychology.
PREDICTION AND CONTROL OF ALERTNESS. III. CALIBRATION OF THE ALERTNESS INDICATOR AND FURTHER RESULTS.
by Roland C. Travis, and John L. Kennedy. 27 Apr 48, 13p
Contract N5ori-058 (02)
SPECDEVCEN-58-2-9
Availability: Published in The Journal of Comparative and Physiological Psychology v42 n1 p45-57 Feb 1949.

Descriptors: (*Attention, Monitors), (*Monitors, Calibration), Performance (Human), Reliability (Electronics), Recording systems, Frequency, Applied psychology.

AD-639 045 **Field 5J, 6P**
CFSTI Prices: HC$4.60 MF$0.50
Tufts Coll., Medford, Mass. Inst. for Applied Experimental Psychology.
APPLICATION OF ELECTRO-PHYSIOLOGICAL TECHNIQUES TO HUMAN PERFORMANCE: THE READING ASSESSOR - THE ALERTNESS INDICATOR.
Rept. for Sep 47-May 49.
1 Apr 50, 50p
Contract N5ori-058 (02)
Proj. NR-782-003
SPECDEVCEN-58-2-11
Rept. on Psychological Studies of Training Techniques. See also AD-639 043., AD-639 044, AD-639 046.

Descriptors: (*Performance (Human), *Electrophysiology), (*Reading, Achievement tests), (*Attention, Monitors), Measurement, Eye, Motion, Brain, Sleep, Fatigue (Physiology), Motor vehicle operators, Aviation personnel, Submarine personnel.

Reading assessor: The purpose was to develop a device to diagnose reading difficulties and provide a means of improving reading comprehension of Naval recruits in the use of manuals and instructional texts. One supposedly hazardous experimental artifact was always present in the experiments. This artifact turned out to be the newly discovered brain wave (the kappa rhythm) which seems to be associated with difficult recall. This new brain wave was superimposed on the eye movement records to the extent that valid electronic counting of the significant eye movements was impossible. The development of a reading assessor was abandoned. Alertness indicator: An individual's level of alertness was found to depend on his motivation, amount of sleep the previous night, boredom of the task, and the like. Experience with practically all subjects who exhibited an occasional state of unalertness to the point of dozing off showed that at the time of inattentiveness the bioelectric output from the forehead region was at a very low level. Just previous to this low tension level certain oscillations in tension level occurred, reaching a high level then suddenly dropping to a low level. Field tests were made aboard

a submarine, on a fatigue air flight, and on a truck driver.

AD-639 046 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Tufts Coll., Medford, Mass. Inst. for Applied Experimental Psychology.
RESEARCH AND DEVELOPMENT OF READING ASSESSOR.
Interim rept.
by Arthur C. Hoffman, and Florence E. Gray. Apr 51, 11p Rept. no. 1
Contract N5ori-058 (03)
SPECDEVCEN-58-3-1

Descriptors: (*Reading, Achievement tests), Eye, Motion, Statistical tests.

In the interest of developing a device for improving level of comprehension, the purpose of the experiment was to test the relationship between comprehension level and certain measures of reading eye-movements. The personnel of the experiment were college students. The reading materials and comprehension checks were taken from standardized reading achievement tests. Eye-movements, while reading, were recorded by means of the electroculogram technique. Comprehension scores were studied in relation to total time taken to read the experimental selection, total number of eye-movements made while reading the selection, number of saccadic movements made in a left-right direction and in a right-left direction along the line of print. Correlations between total count and number of left-right saccadic movements with comprehension score were not found to be significant. Number of regressive saccades and total time were found to predict comprehension score. (Author)

AD-639 089 **Field 5J, 5I**
CFSTI Prices: HC$1.00 MF$0.50
Purdue Research Foundation, Lafayette, Ind.
THE EFFECT OF VARIOUS NOISE LEVELS ON PERFORMANCE OF THREE MENTAL TASKS.
Technical rept.
by T. D. Hanley, and R. J. Williamson. 15 Dec 50, 25p
Contract N6ori-104 (02)
Projs. 20-K-1, NR-782-003
SPECDEVCEN-104-2-21

Descriptors: (*Noise, *Performance tests), Psychometrics.

In an attempt to determine the effect of various levels of constant noise and of variable noise on subjects' ability to perform three clerical type mental tasks, the following research design was followed: (A) The noise created by a battery of office machines was recorded. (B) The recorded noise was played into a reverberant chamber at various predetermined levels while subjects performed simple mental tasks. (C) Performance on the tasks was scored for the various noise conditions and the data were treated statistically to determine whether observed differences were significant. Results of the statistical analysis showed that the amount of noise was not systematically related to proficiency in performing the mental tasks. (Author)

AD-639 107 **Field 5J, 17B, 5I**
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
A STUDY OF THE EFFECTS OF STRESS ON SPEAKING AND LISTENING ABILITIES.
Technical rept.
by J. W. Asher, L. A. Doty, T. D. Hanley, and M. D. Steer. 18 Feb 57, 15p
Contract N6ori-104 (02)
Proj. 20-F-8
NAVTRADEVCEN-104-2-50

Descriptors: (*Stress (Psychology), *Psychomotor tests), (*Noise, Stress (Psychology)), Voice communication systems, Speech, Intelligibility, Auditory perception, Training.

The study was undertaken to determine the effects of experimentally induced stress on the accuracy and speed with which individuals listened to and repeated messages. For a stress situation, subjects were required to perform a psychomotor task while listening to recorded word lists in the presence of noise. The following three levels of stress were investigated: (1) Listening and speaking task only. (2) Listening and speaking task plus a simple psychomotor task. (3) Listening and speaking task plus a complex psychomotor task. When an individual must perform simultaneously two sensorymotor tasks that require some degree of accuracy and speed, his performance in both tasks is affected adversely. The more complex the task, the greater the decrement in performance, and the more likely the individual is to show evidence of emotional stress. (Author)

AD-639 109 **Field 5J, 6P**
CFSTI Prices: HC$3.00 MF$0.75
Human Engineering Labs., Aberdeen Proving Ground, Md.
PITCH PERCEPTION.
Technical note.
by Robert B. Lawson. Oct 65, 73p TN-7-65
Prepared in cooperation with Delaware Univ., Newark.

Descriptors: (*Pitch discrimination, State-of-the-art reviews), Auditory perception, Nervous system, Hearing, Theory, Frequency, Ear, Sensitivity, Deafness, Auditory nerve, Nerve fibers, Humans, Animals.

Identifiers: Masking (Perception).

The paper is a comprehensive review of auditory theory and research that bear directly or indirectly on pitch perception. It considers pitch perception from three major points of view. First, it reviews the history of pitch-perception studies and describes some representative theories of hearing they have engendered. Second, this paper examines various auditory phenomena in the light of how well the different theoretical positions can explain them. Finally, it attempts to collate physiological and anatomical findings about the auditory nervous system and, again, use the facts which emerge to test the adequacy of theoretical concepts and explanations. The 213 references include studies of both humans and animals. (Author)

AD-639 118 **Field 5J**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
MASKING BY TONES VS NOISE BANDS.
by Richard H. Ehmer. 20 Nov 58, 4p Rept. no. 333
Presented to the American Psychological Association, 3 Sep 57.
Availability: Published in The Journal of the Acoustical Society of America v31 n9 p1253-6 Sep 1959.

Descriptors: (*Auditory signals, Masking), Noise, Auditory perception, Auditory nerve, Hearing, Audiometry, Psychoacoustics.

In a previous study it was proposed that tonal masking arose mainly from the cochlear activity pattern of the masking tone, modified by the formation of beats between the signal and masking tones. The present study casts further light on these proposed mechanisms by comparing the masking effects of pure tones of 500, 1000, 2000, and 4000 cps at 60 and 80 db SL with 1/3 octave bands of noise of equal intensities and centered at the same frequencies. The results show that the noise bands produce about the same amount of extended masking despite the absence of any possible aural harmonic distortion, but greater direct masking due to the elimination of beats. Furthermore, the noise-masking curves join the tone-masking curves at the second peak in the latter, providing strong additional support for the proposed mechanisms of auditory masking. (Author)

AD-639 133 **Field 5J**
Not available from CFSTI.
National Research Council of Canada, Ottawa (Ontario). Div. of Applied Physics.
THE MEASUREMENT OF COLOR DIFFERENCES.
by Gunter Wyszecki. 25 May 65, 13p
NRC-8945
Published in Unidentified Journal.

Descriptors: (*Colors, Visual perception), (*Colorimetry, Analysis of variance), Scale.

Some of the principles of measuring color differences are discussed and elaborated upon by means of examples. Suggestions for future research work are also given. (Author)

AD-639 224 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Naval Personnel Research Activity, San Diego, Calif.
AN EVALUATION OF A SHORT FORM OF THE RADIO CODE APTITUDE TEST.
Research rept.
by Bernard Rimland. Aug 66, 11p SRR-67-2
Proj. PF016050101

Descriptors: (*Aptitude tests, Coding), (*Radio communication systems, Coding), Test construction (Psychology), Reliability.

Identifiers: Evaluation.

The Radio Code Aptitude Test (RCAT) has been used during and since WWII in the selection of personnel for Morse Code training. As a result of recent criticism that the test was too highly speeded toward the end, and was thus hopelessly outpacing and demotivating the testees, an analysis was made of the feasibility of eliminating most of the fast-paced latter items of the RCAT. Statistical analysis of a sample of completed RCAT answer sheets showed the final sixty items (40 per cent) of the RCAT could be eliminated with no loss in psychometric efficiency. The short (60 per cent) form correlated .96 with the long form, and each form had a reliability of .95. Since most items unanswered by the testees were found to have occurred in the final, highly-speeded 40 per cent of the test, it may be assumed that testee frustration will be greatly reduced by the shortened RCAT. It is recommended that items 166 through 225 be omitted from future testing with the Radio Code Aptitude Test. A conversion table for obtaining Navy Standard Scores from the new short form RCAT is provided. (Author)

AD-639 256 **Field 5J**
Not available from CFSTI.
Iowa State Univ., Iowa City.
EVIDENCES OF ASSOCIATIVE INTERFERENCE IN PSYCHOMOTOR PERFORMANCE.
by Don Lewis, Alfred H. Shephard, and Jack A. Adams. 1949, 4p
Contract N5ori-057 (02)
SPECDEVCEN-57-2-11
Availability: Published in Science v110 n2855 p271-3 Sep 16 1949.

Descriptors: (*Psychomotor tests, Performance (Human)), Learning, Interference, Transfer of training.

AD-639 276 **Field 5J, 5I**
CFSTI Prices: HC$1.10 MF$0.50
Iowa State Univ., Iowa City.
PRELIMINARY REPORT ON FIXED GUNNERY SLIDE FILM DEFLECTION TRAINER (3-C-9).
by Kenneth W. Spence. Apr 51, 16p
Contract N5ori-057 (01)
Proj. 20-B-1
SPECDEVCEN-57-1-2

Descriptors: (*Learning, *Gunnery trainers), Training films, Deflection, Still projectors, Transfer of training, Direction finding.

The investigation was concerned with the following problems: (1) Analysis of the factors involved in the learning process on a single film. (2) The effect of limiting the time interval of firing. (3) The nature and extent of transfer of training effects from the first film to a second film. (4) The accuracy of the photoelectric scoring system. (Author)

AD-639 277 **Field 5J, 5I**
CFSTI Prices: HC$1.10 MF$0.50
Iowa State Univ., Iowa City.
MEMORANDUM ON PROGRESS OF LEARNING STUDY ON AERIAL GUNNERY TRAINING DEVICE 3-A-2.
by E. B. Knauft. Oct 46. 4p
Contract N5ori-057 (01)
Proj. 20-B-1
SPECDEVCEN-57-1-3

Descriptors: (*Learning, *Gunnery trainers). Military training. Psychometrics. Aerial gunnery.

The research on the 3-A-2 device is designed to provide answers to the following questions: (1) What is the limit of skill attainable on the device. (2) What amount of practice is required to reach this limit. (3) What is the nature and shape of the learning curve. (4) What is the optimal length and spacing of practice trials to use in training personnel on this device.

AD-639 279 **Field 5J, 5I**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ., Iowa City.
AN EXPERIMENTAL STUDY OF LEARNING ON THE AERIAL GUNNERY TRAINING DEVICE 3-A-2.
by E. B. Knauft, C. E. Hamilton, and K. W. Spence. Apr 47. 17p Rept. no. 5
Contract N5ori-057 (01)
Proj. 20-B-1
SPECDEVCEN-57-1-5

Descriptors: (*Learning, *Gunnery trainers). Aerial gunnery. Military training. Performance (Human). Transfer of training.

On the basis of information from the preliminary experiment, the main experiment was set up to study the learning functions for subjects firing at film representing one bomber speed (200 knots).

AD-639 281 **Field 5J, 5E**
CFSTI Prices: HC$2.00 MF$0.50
Iowa State Univ., Iowa City.
THE ACCURACY OF POSITIONING REACTIONS AS A FUNCTION OF DIRECTION AND EXTENT.
by Judson S. Brown, E. B. Knauft, and G. Rosenbaum. Apr 51. 28p Rept. no. 1
Contract N5ori-057 (02)
SPECDEVCEN-57-2-1

Descriptors: (*Positioning reactions, Performance (Human)). Human engineering.

The study is the first of a series of related experiments on simple motor capacities designed to provide data of possible utility for the design of equipment. The specific purpose of the study was to measure the accuracy with which individuals can perform positioning reactions in the absence of visual corrective cues. As used here, the term positioning reaction refers to a unitary movement of an articulate member of the body from a position of rest to another position in space.

AD-639 282 **Field 5J, 5E**
Not available from CFSTI.
Iowa State Univ., Iowa City.
DISCRETE MOVEMENTS IN THE HORIZONTAL PLANE AS A FUNCTION OF THEIR LENGTH AND DIRECTION.
by Arthur T. Slater-Hammel, and Judson S. Brown. Apr 51. 25p Rept. no. 2
Contract N5ori-057 (02)
SPECDEVCEN-57-2-2
Availability: Published in unidentified source.

Descriptors: (*Positioning reactions, Performance (Human)). Hands. Reflexes. Motion. Human engineering.

The task set for the subjects was to move the limb as rapidly and accurately as possible from one fixed position in space to another. The positions were indicated by black lines on a white background. Each movement was initiated at the sound of a buzzer. All odd-numbered movements were made from left to right and the others from right to left. Through the use of this method, the subjects were aware in advance of both the distance to be moved and the direction of movement. The actual movements were made with the right hand and arm in the horizontal plane along a line parallel to the frontal plane of the body. Detailed graphic records were obtained by having the subjects move a lightweight pointer which was coupled by threads to a recording system having low friction and inertia. This made possible the measurement of reaction time, total-movement time, speed of movement, etc. The principal experimental variables were (1) distance moved, and (2) direction of movement (left to right and right to left). (Author)

AD-639 283 **Field 5J**
Not available from CFSTI.
Iowa State Univ., Iowa City.
THE EFFECT OF SPEED-UP INSTRUCTIONS UPON THE PERFORMANCE OF DISCRETE MOVEMENTS IN THE HORIZONTAL PLANE.
by Judson S. Brown, and Arthur T. Slater-Hammel. Apr 51. 18p Rept. no. 3
Contract N5ori-057 (02)
SPECDEVCEN-57-2-3
Availability: Published in unidentified Journal.

Descriptors: (*Motor reactions, *Motivation). Performance (Human). Time studies.

An investigation was made of the effect of special speed-up instructions upon the performance of discrete movements of the hand and arm. The instructions consisted of repeated statements by the experimenter emphasizing the importance of speed. Urging the subjects to move more rapidly had no effect upon the time required to initiate a movement following the sounding of the buzzer. In both studies the mean reaction time was found to be 0.25 sec. The time required to perform the first phase of the movement (primary-movement time) decreased significantly for all three lengths of movement as a result of the speed-up instructions. The time taken to perform the complete movement (total-movement time) was slightly, but not significantly, reduced at the two longer distances and increased at the shortest. Thus attempts to speed one's movements may produce apparent increases in speed which, in terms of overall efficiency, yield little genuine improvement. The variabilities of the total-movement time scores were significantly reduced, however, at the two longer distances. The time spent in making the fine, secondary adjustments following the initial gross approaches to the desired point (primary movements) was significantly increased (at two of the movement-distances) by the speed-up instructions. (Author)

AD-639 284 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ., Iowa City.
POSITIONING REACTIONS OF UNIFORM LENGTH EXECUTED AT VARIOUS DISTANCES FROM THE BODY.
by Judson S. Brown, and E. B. Knauft. Jul 48. 9p Rept. no. 4
Contract N5ori-057 (02)
SPECDEVCEN-57-2-4

Descriptors: (*Positioning reactions, Performance (Human)). Operators (Personnel).

In general, the results indicate that the accuracy with which a movement can be terminated as a desired position is not significantly affected by the distance from the body at which it is executed when length of movement remains constant. This is apparently the case for both inward and outward movements. Outward movements appear rather consistently to go beyond the intended mark, whereas inward movements do not. There is no statistically significant difference between the two directions, however, with respect to their absolute accuracy. Although a normal degree of confidence may be placed in the data for outward movements, those obtained for inward movements must be regarded as somewhat tentative, since the initial performance of the outward movements might have affected the subsequent performance of the inward movements. Indirect evidence is presented, however, which supports the view that transfer from the first to the second session was, in all probability, negligible. (Author)

AD-639 285 **Field 5J, 5E**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ., Iowa City.
CHARACTERISTICS OF DISCRETE MOVEMENTS IN THE HORIZONTAL PLANE WHEN EXECUTED WITH ONE AND WITH TWO HANDS.
by Judson S. Brown, Arthur T. Slater-Hammel, and E. A. Bilodeau. Aug 48. 18p Rept. no. 5
Contract N5ori-057 (02)
SPECDEVCEN-57-2-5

Descriptors: (*Positioning reactions, Performance (Human)). Reflexes. Hands. Human engineering.

There are no significant differences attributable to direction of movement in the case of either one- or two-handed movements. The time required to execute the first phase of a movement (primary-movement time) is, in general, longer for two-handed than for one-handed movements. The time spent in executing the fine, secondary adjustments following the initial gross approaches (primary movements) to the desired point was less for two hands than for one, the difference being highly significant at the 40 cm. point. The data obtained for two-handed movements on average speed and maximum speed of movement indicate that in both instances the two-handed movements are slower than the one-handed movements when made over comparable distances. (Author)

AD-639 287 **Field 5J, 17I, 5H**
CFSTI Prices: HC$3.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md.
APPRAISAL OF AN EXPERIMENTAL PLAN POSITION INDICATOR PRESENTING SIMULATED BEARING, RANGE, AND HEIGHT INFORMATION.
by J. W. Gebhard, and E. A. Bilodeau. 15 Dec 47. 57p
SPECDEVCEN-166-1-37

Descriptors: (*Plan position indicators, Human engineering), (*Search radar, Display systems). Radar operators. Range finding. Direction finding. Height finding. Simulation. Performance (Human).

Two experiments were performed to appraise a conventional polar coordinate display modified to present bearing, range, and height information. The display consisted of a PPI surrounded by an annulus. Each target was represented by two blips on the same bearing: the inner blip on the PPI gave bearing and range, and the outer blip in the annulus gave bearing and height. The display was a synthetic or simulated display. Engineering modifications actually to reproduce bearing, range, and height information on this PPI were not accomplished. The purpose of this appraisal is psychological one: to determine how accurately a man can understand and extract information from a display of this sort. (Author)

AD-639 288 **Field 5J, 17I**
CFSTI Prices: HC$3.00 MF$0.75
Johns Hopkins Univ., Jamestown, R. I. Systems Research Field Lab.
ACCURACY OF ALIGNING THE MOVABLE RANGE MARKER WITH BLIPS ON THE PLAN POSITION INDICATOR.
by J. W. Gebhard. 1 Aug 48. 59p
Contract N5-ori-166 (01)
SPECDEVCEN-166-1-46

Descriptors: (*Plan position indicators, *Performance (Human)), Alignment, Radar operators, Range finding, Errors, Operation.

Four experiments were performed to determine the accuracy of aligning the movable range marker on the rotating sweep of the PPI with blips on a 20-mile sweep. The procedure consisted of mixing target simulator and range marker video and displaying the combined signals on the experimental PPI's and the VF precision indicators used for making the measurements. The task of the PPI operator was to align his marker as accurately as possible with the center of the blip. The VF operator then measured the degree and direction of the discrepancy between target and marker on the B-scope. These errors, expressed in yards, were the data used for describing alignment accuracy. In the first three experiments operator differences were significant. In the fourth experiment they were not. Since a number of the same operators served in all experiments this may have been due to practice. A constant error was found in the last three experiments. Operators tended to align the marker at a range about 10 yards short of the center of the target. These experiments set a value for the accuracy of the psychophysical performance which is the basis for the use of one kind of range strobe. The order of accuracy with which radarmen can adjust the movable range marker to a target suggests that PPI equipments furnished with stable, linear ranging circuits and more finely graduated counters could be read much more accurately than is now the case.

AD-639 291 **Field 5J, 5E**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ., Iowa City.
DISCRETE MOVEMENTS TOWARD AND AWAY FROM THE BODY IN THE HORIZONTAL PLANE.
by Judson S. Brown, Edward W. Wieben, and Eugenia B. Norris. Sep 48. 11p Rept. no. 6
Contract N5ori-057 (02)
SPECDEVCEN-57-2-6

Descriptors: (*Positioning reactions, Performance (Human)), Reflexes, Motion, Hands, Human engineering.

The basic movement-conditions were altered so that the individuals were required to move along a line lying in the horizontal plane but perpendicular to the frontal plane of the body, i.e., toward and away from the front of the body along a horizontal surface. The major experimental variables were length of movement (2.5, 10, and 40 cm.) and direction of movement (inward and outward). (Author)

AD-639 292 **Field 5J**
Not available from CFSTI.
Iowa State Univ., Iowa City.
DEVICES FOR STUDYING ASSOCIATIVE INTERFERENCE IN PSYCHOMOTOR PERFORMANCE: I. THE MODIFIED MASHBURN APPARATUS.
by Don Lewis, and Alfred H. Shephard. 23 Aug 49. 12p
Contract N5ori-057 (02)
SPECDEVCEN-57-2-7
Availability: Published in The Journal of Psychology v29 p35-46 1950.

Descriptors: (*Psychomotor tests, Test equipment), Performance (Human), Learning, Errors, Interference.

A special model of the Mashburn Apparatus has been developed for use in investigations of associative interference. The principal innovations are provisions for interchanging and/or reversing the three controls on the apparatus and for counting errors in performance. When original practice with one arrangement of the controls is followed by interpolated practice with a different arrangement and the interpolated practice is then followed by a relearning of the original task, clear evidences of associative interference appear--evidences in the form of decreases in number of matches, increases in number of errors, and increases in error-match ratio. (Author)

AD-639 293 **Field 5J**
CFSTI Prices: HC$2.60 MF$0.50
Iowa State Univ., Iowa City.
THE EVALUATION OF DIFFICULTY OF TASK UNDER SEVERAL DIFFERENT CONDITIONS OF PERFORMANCE OF THE MODIFIED MASHBURN APPARATUS.
Technical rept.
by Jack A. Adams. 1950. 29p
Contract N5ori-057 (02)
Projs. NR-783-002, SDC-20-M-1
SPECDEVCEN-57-2-8

Descriptors: (*Psychomotor tests, Performance (Human)), Transfer of training, Learning.

Six groups, each composed of from 15 to 18 male students, served as subjects. Each of the groups performed on one of six tasks. Ten two-minute practice trials were given on each of two consecutive days. Twelve different measures or indices of relative difficulty were considered, six of them relating to the data on number of matches and six of them relating to error-match ratios. The analyses showed that no single measure was completely adequate to reveal the relative difficulty of the six tasks. A general index of difficulty (G.I.D.) was computed by obtaining the product of the grand mean of matches and the mean of slopes and dividing the product by the grand mean of errors. The values of the G.I.D. provided a seemingly reliable basis for rating the six tasks in relative difficulty. It could be shown that the maximum amount of positive transfer was operating for the easiest task and that the maximum amount of negative transfer was operating for the two most difficult tasks. It could also be shown that the number of errors made on individual controls was, in several cases, dependent upon transfer. However, the evidence clearly indicated that the difficulty of psychomotor tasks such as those available on the Modified Mashburn Apparatus cannot be reliably inferred from suppositions concerning transfer. (Author)

AD-639 294 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ., Iowa City.
THE PROBLEM OF CONTROLLING LEVEL OF LEARNING IN STUDIES OF ASSOCIATIVE INTERFERENCE IN PSYCHOMOTOR PERFORMANCE.
Technical rept.
by Jack A. Adams. Apr 49. 11p
Contract N5ori-57 (02)
Proj. NR-783-002
SPECDEVCEN-57-2-9

Descriptors: (*Psychomotor tests, Performance (Human)), Learning, Test methods, Word association, Interference, Transfer of training.

A satisfactory solution of the problem of controlling level of learning on a psychomotor task could assume that level of learning is most adequately controlled when each individual has attained the same relative level with respect to his own learning potential. This level could be one-third or one-half or some other part of the individual's total potential ability to perform. Using this criterion, it would be necessary to give each subject a fixed number of trials on; say, the Mashburn apparatus, fit a curve to the resulting scores, and then extrapolate to obtain an estimate of his performance asymptote. Each subject could then be given the number of practice trials required to reach the predetermined level with respect to this predicted asymptote. The determination of this level would be made upon the assumption of equality of units at different points of the learning curve. Level of learning could be regarded as more nearly equal because each subject would have attained the same relative level with respect to his own performance asymptote. If a group curve were desired, the Vincent technique would have to be employed to combine the individual curves where each would have a different number of trials in attaining the criterion. (Author)

AD-639 304 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ., Iowa City.
DEVICES FOR STUDYING INTERFERENCE IN PSYCHOMOTOR PERFORMANCE: III. THE DOUBLE-DISK PURSUIT APPARATUS.
Technical rept.
by Don Lewis. 1 Jun 53. 19p
Contract N5ori-57 (02)
Projs. NR-783-002, SDC-20-M-1
SPECDEVCEN-57-2-13
See also AD-639 361.

Descriptors: (*Psychomotor tests, Test equipment), Learning, Performance (Human), Interference.

Three attempts were made with rotary pursuit apparatus to induce decrements in performance subsequent to interpolated practice. An ordinary Koerth-type rotor was first employed with mirror-vision practice preceding direct-vision practice. Mirror-vision performance during relearning was not adversely affected by the interpolated practive. With the Double-Disk Pursuit Apparatus, subjects learned to trace a kind of figure-eight pattern. Original practice with the disks rotating in one way was followed by practice with the directions of rotation reversed. The decrements that appeared at the outset of relearning were small and could not confidently be attributed to interference effects. A second model of the Double-Disk Pursuit Apparatus provided for a variable pursuit pattern. The change in the tasks, as between original and interpolated learning, depended upon a reversal of the directions of rotation of the disks. Here again, a decrement appeared at the outset of relearning, but it was too small to be clearly identifiable as a product of interference. (Author)

AD-639 305 **Field 5J**
Not available from CFSTI.
Iowa State Univ., Iowa City.
DEVICES FOR STUDYING ASSOCIATIVE INTERFERENCE IN PSYCHOMOTOR PERFORMANCE: IV. THE TURRET PURSUIT APPARATUS.
by Don Lewis, and Alfred H. Shephard. 11 Oct 49. 10p
Contracts N9onr-938 (01), N5ori-057 (02)
SPECDEVCEN-57-2-14
See also AD-639 304.
Availability: Published in The Journal of Psychology v29 p173-82 1950.

Descriptors: (*Psychomotor tests, Test equipment), Performance (Human), Training devices, Interference, Learning.

A pursuit device has been developed which requires a subject to manipulate two controls so as to effect continuous changes in the azimuth and elevation positions of a spot of light. The task is to keep the spot of light on a target (photocell) which moves through an irregular course. A preliminary study showed that if skill is first acquired with the controls arranged in the standard way, and if practice is then given with the controls reversed, reliable decrements in ability to perform the original task appear at the outset of relearning. Some subjects were affected far more than others by the interpolated practice, indicating marked difference in individual susceptibility to associative interference. (Author)

AD-639 306 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ., Iowa City.
A DEMONSTRATION OF RETROACTIVE INTERFERENCE IN PURSUIT ROTOR LEARNING.
Technical rept.
by Abram M. Barch. Dec 51, 18p
Contract Nonr-166 (00)
Projs. NR-783-002, SDC-20-M-1e
SPECDEVCEN-166-00-1
See also PB-101 716, PB-101 761, AD-639 304, AD-369 362.

Descriptors: (*Psychomotor tests, Performance (Human)), Learning, Interference, Transfer of training.

In an experiment designed to induce reliable amounts of retroactive interference, two groups of college males practiced the Epicyclic Pursuit Rotor task under conditions of well-distributed practice, frequent opportunities to warm-up, medium to high levels of original learning (OL) and interpolated learning (IL), and a short interval between OL and (relearning) RL. Group X (n = 20) was given 30 trials of OL on Day 1, 30 trials of IL on Day 2, 3 trials of IL followed by 30 trials of RL on Day 3. Group C (n = 23) had 30 trials of OL on Day 1 and 30 trials of RL on Day 3. For IL, the pursuit pattern was rotated 180 degrees as compared with the pattern for OL and RL. On the first RL trial Group X was significantly lower than Group C with respect to mean time on target, mean number of contacts and mean time per contact. There were no significant differences on the second RL trial. Although the effect was brief, retroactive interference was reliably demonstrated. The IL practice had no effect on the warm-up decrements present in RL. (Author)

AD-639 354 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Psychophysics Lab., Univ. of Washington, Seattle.
A SIGNIFICANCE TEST FOR ONE PARAMETER ISOSENSITIVITY FUNCTIONS.
Technical rept.
by Vivian Gourevitch, and Eugene Galanter. 10 Jan 66, 20p PLR-19A
Contract DA-49-193-MD-2713

Descriptors: (*Statistical tests, *Psychometrics), Sensitivity, Biophysics, Decision theory, Reaction (Psychology).

A large-sample test for the significance of the difference between two detection data points is developed based upon the assumptions of a one-parameter signal detectability model. In essence, the null hypothesis tested is that two observed data points belong to the same d' function. (Author)

AD-639 355 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Psychophysics Lab., Univ. of Washington, Seattle.
CONFORMITY TO EXPERIMENTER-DETERMINED, PAY-OFF ENFORCED, CRITERION LEVELS IN THE METHOD OF RANDOM STAIRCASES.
Technical rept.
by George Semb, and Michael G. Saslow. 31 Mar 66, 9p PRP-21A
Contract DA-49-193-MD-2713

Descriptors: (*Psychometrics, Game theory), Hearing, Thresholds (Physiology), Biophysics, Motivation, Reaction (Psychology).

Outcome structures are incorporated into the method of random, yes-no staircases. Results obtained from subjects paid to meet arbitrary criteria are compared with ordinary determinations of limens for intensive increments of white noise above a constant background of white noise. It is demonstrated that a subject can reliably exhibit a variety of arbitrarily determined 'thresholds' when appropriate pay-off contingencies are introduced. (Author)

AD-639 360 **Field 5J**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md.
THE SUBITIZING AND COUNTING OF VISUALLY PRESENTED FIELDS OF DOTS.
Memo rept.
by E. M. Jensen, E. P. Reese, and T. W. Reese.
1 Aug 50, 34p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-MHC-6
Prepared in cooperation with Mount Holyoke Coll., South Hadley, Mass., Psychophysical Research Unit. See also AD-639 142.
Availability: Published in Journal of Psychology v30 p363-92 1950.

Descriptors: (*Numbers, *Counting methods), Time studies, Errors, Visual signals, Graphics, Equations.

Fields of dots, ranging in number from 1-30, were projected on a screen. S's were instructed to report the number of these dots, and they were given all the time they needed to do so. From the data, analyzed in terms of accuracy of report and the time between the stimulus and the report, the following conclusions were made: (1) S's reports of 1-30 dots were on the average highly accurate. (2) The first derivative of the function relating report-time and number of dots presented is discontinuous at about 6 stimulus-dots. (3) The function relating report-time and number of dots presented has a characteristic shape. This is most clearly seen when the data are transformed by a reciprocal equation and plotted on semilogarithmic coordinates. On these coordinates the first 5 or 6 points fall along a straight line which has a high negative slope. The remaining points fall along a shallow, decelerating curve. (4) S's subitized (i.e., handled accurately, without counting) up to 5 or 6 dots and counted the rest. They subitized up to 5 or 6 dots even though accuracy was stressed, and they were given time enough to count. (Author)

AD-639 361 **Field 5J**
Not available from CFSTI.
Iowa State Univ., Iowa City.
DEVICES FOR STUDYING ASSOCIATIVE INTERFERENCE IN PSYCHOMOTOR PERFORMANCE: II. THE MODIFIED TWO-HAND COORDINATOR.
by Alfred H. Shephard, and Don Lewis. 29 Aug 49, 14p
Contract N5ori-057 (02)
SPECDEVCEN-57-2-12
See also AD-639 292.
Availability: Published in The Journal of Psychology v29 p53-66 1950.

Descriptors: (*Psychomotor tests, Test equipment), Learning, Interference, Performance (Human).

A special model of the Two-hand Coordinator was developed. The device is basically similar to the standard instrument but provides for reversing and interchanging the controls, changing the rate of movement of the contact button, and recording response errors. The use of the coordinator in studies of interference has been illustrated. The chief evidences of interference are decrements in time-on-target scores and increases in number of errors. Of incidental interest among the results presented in this paper are curves showing the general effects on relearning of two different levels of original learning where the amount of interpolated practice is held constant. The Modified Two-hand Coordinator promises to be a highly useful device for investigating associative interference in psychomotor performance. (Author)

AD-639 362 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Iowa State Univ., Iowa City.
RETROACTIVE FACILITATION AND INTERFERENCE IN PERFORMANCE ON THE MODIFIED TWO-HAND COORDINATOR.
Technical rept.
by Don Lewis, and Paul N. Smith. Dec 51, 22p
Contract Nonr-166 (00)
Projs. NR-783-002, SDC-20-M-1e
SPECDEVCEN-166-00-2

Descriptors: (*Psychomotor tests, Performance (Human)), Learning, Interference, Transfer of training.

The study demonstrates how the learning of a new skill can interfere with the performance of another skill which has already been learned. Such an effect is called 'retroactive interference'. Six groups of female subjects, ten per group, first attained a prescribed level of proficiency on the standard task of the Modified Two-Hand Coordinator. The five experimental groups then attained different levels of proficiency on the reversed coordinator task, while the control group went without practice of any kind. All groups relearned the standard task under uniform conditions. The results showed, as expected, that the amount of retroactive interference as reflected by losses in proficiency during relearning, depended upon the level of proficiency attained on the reversed task during interpolated learning (IL). There were no indications that differential amounts of retroactive facilitation were developed during IL. This was contrary to expectations. (Author)

AD-639 385 **Field 5J, 17I**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md.
THE ACCURACY OF RANGE ESTIMATION ON A PPI WITH RESPECT TO THE DISTANCE OF THE TARGET FROM RANGE RINGS.
Revised ed.
1 May 58, 11p
Contract N5-ori-166 (01)
NAVTRADEVCEN-166-1-29
Report on Tools for more effective training. Revision of manuscript submitted 1 Nov 47.

Descriptors: (*Range finding, Radar operators), (*Plan position indicators, Range finding), Ranges (Distance), Radar target position simulators, Errors, Radar targets, Radar trainers.

Four radar operators estimated the location of targets on simulated PPI's. Their data were analyzed for accuracy of range estimation as a function of target position with respect to range rings. The grouped data show that the average accuracy of estimation changes in a complex fashion as the distance from the range ring to the target increases. In general, targets near range markers and those near the center of the inter-ring distance are judged more accurately than those at other places. (Author)

AD-639 391 **Field 5J, 17I**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
AN ILLUSORY ROTATING SWEEP.
by A. L. Sweet, and N. R. Bartlett. 16 Dec 47, 6p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-40
Availability: Published in American Journal of Psychology v61 n3 p400-4 Jul 1948.

Descriptors: (*Radar images, *Illusions), Cathode ray tube screens, Radar operators, Visual signals.

The report calls attention to an illusory sweep appearing under certain conditions on cathode-ray tube-screens. The illusion is seen on the screen of tubes having a rotating sweep and when, combined with other conditions, the rotation of the sweep exceeds speeds of the order of 15-20 rpm. The illusion is a second sweep line seen rotating behind the real sweep. Its general characteristics

suggest that the phenomenon is Bidwell's ghost. Since the type of cathode-ray tube on which the illusion appears is widely used in radar, the presence of this illusory sweep may be a source of confusion to radar operators, particularly if the radar should be operated at a fast antenna speed. Furthermore, the second sweep is likely to be interpreted by technicians as evidence for some failure in the equipment. Many engineering hours already have been lost in checking parts and circuit diagrams to identify such presumed equipment failure. (Author)

AD-639 393 **Field 5J**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md. Dept. of Psychology.
FACTORS INFLUENCING ROTARY PERFORMANCE.
by John David Reed. 31 Mar 49, 29p
Contract N5ori-166 (01)
SPECDEVCEN-166-I-50
Availability: Published in The Journal of Psychology v28 p65-92 1949.

Descriptors: (*Performance (Human), Rotation), Hand cranks, Performance tests.

Man is frequently called upon to turn cranks. In spite of this fact, the problem of what constitutes the best crank or what conditions will lead to better rotory performance is still obscure. The 'best crank' may not, however, be described in absolute terms but must be specified in terms of the task required. For example, the crank which was designed to permit a constant rate of turning probably would not be the same as one designed to permit rapid reversals of direction. One immediate criterion is the maximal rate of rotation. In the study this criterion was selected as being both a useful adjunct to our knowledge of human capabilities and one concerning which there is little information available. It should be emphasized that the results obtained, which concern maximal rate of turning, should not be assumed to apply to other performances with different criteria. (Author)

AD-639 496 **Field 5J**
CFSTI Prices: HC$5.00 MF$1.00
Mount Holyoke Coll., South Hadley, Mass. Psychophysical Research Unit.
PSYCHOPHYSICAL RESEARCH: SUMMARY REPORT 1946-1952.
by T. B. Haley. Jan 53, 196p
Contracts N6ori-166 (01), Nonr-131 (01)
SPECDEVCEN-131-1-5, NAVEXOS-P-1104

Descriptors: (*Psychophysiology, Reviews), Visual perception, Physical properties, Decision making.

Identifiers: Psychophysics.

Contents: Bibliographical research; Mathematical research; Research on visual inclination (Bearing); Research on length; Research on area; Research on number; Discriminable aspects for coding; Research on subjective geometry; General problems in judgment; Subjective statistics.

AD-639 563 **Field 5J, 5E, 9B**
CFSTI Prices: HC$1.60 MF$0.50
RAND Corp., Santa Monica, Calif.
MOTIVATIONAL PROBLEMS IN HUMAN-COMPUTER OPERATIONS.
by Nehemiah Jordan. 5 Jun 61, 13p P-2332
Presented at the Annual Human Engineering Conference (9th), St. Louis, Mo., 1-2 Jun 61.

Descriptors: (*Motivation, *Computer operators), Human engineering, Man-machine systems, Computers.

AD-639 612 **Field 5J**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Inst., Bethesda, Md.
CENSURE OF THE MODEL IN THE CONTAGION OF AGGRESSION.
by Ladd Wheeler, and Seward Smith. 1966, 20p

Descriptors: (*Behavior, Control), Anxiety, Emotions, Group dynamics, Leadership.

Identifiers: Aggression.

Mood strongly differentiated the No Instigation treatment from all other groups, who showed pronounced negative mood shifts. Generally there were no differences among these latter groups. The exception was the factor of depression, which was greater for the E Censure group than for any other. Only in this condition were restraints against aggression reduced and then immediately reinstated before S had an opportunity to emit any behavior. If one has the practical aim of minimizing aggression within a group, he must remain aware of the fact that authoritarian censure of the person who expresses the dominant group feeling may result in a feeling of depression even more damaging than the free expression of aggression. (Author)

N66-23928 **Field 5J**
CFSTI Prices HC$2.00 MF$0.50
Washington Univ., Seattle.
STUDIES OF THE CONSTANT ERROR.
by E. Galanter, and D. A. Ronken. 1 Nov 65, 41p NASA-CR-74695, PLR-14N
Contract NONR-477/34/
Sponsored In Part By Nasa

Descriptors: Constant, *Decision, *Error, Human factor, Image, Memory, Performance, *Psychometrics, Psychophysics, Psychophysiology, Retention, *Stimulus.

For abstract, see S 04 13.

N66-24694 **Field 5J**
CFSTI Prices HC$2.00 MF$0.50
Bolt, Beranek, And Newman, Inc., Cambridge, Mass.
A QUANTAL INTERPRETATION OF SENSORY CHANNEL UNCERTAINTY AND REACTION TIME AND THE PSYCHOLOGICAL TIME QUANTUM AND THE DISCRIMINATION OF SUCCESSION.
by A. B. Kristofferson. May 66, 39p NASA-CR-455
Contract NAS2-2486

Descriptors: Behavior, Detection, Factor, Human, Perception, *Psychophysiology, Quantum, Reaction, *Reaction time, Sensory, *Sensory perception, Signal, Time, *Time factor.

For abstract, see S 04 13.

N66-26233 **Field 5J**
CFSTI Prices HC$2.00 MF$0.50
Maryland Univ., College Park.
REINFORCING VALUE OF INFORMATION TECHNICAL REPORT NO. 65-1.
by D. P. Hendry. 1965, 27p NASA-CR-74906
Grant NSG-189-61

Descriptors: Animal, *Animal study, Chimpanzee, Discrimination, Experiment, *Information, Negative, Positive, *Psychological testing, Psychology, *Reinforcement, Stimulus, Study, Testing.

For abstract, see S 04 14.

N66-35021 **Field 5J**
CFSTI Prices HC$2.00 MF$0.50
California Univ., Los Angeles.
NEUROPHYSIOLOGICAL AND BEHAVIORAL STUDIES OF CHIMPANZEES SEMIANNUAL REPORT, JAN. 1 - JUN. 30, 1966.
by W. R. Adey, and J. D. French. 1 Aug 66, 32p NASA-CR-77386
Grant NSG-502

Descriptors: Analysis, Animal, *Apollo project, Behavior, *Bioinstrumentation, Biotelemetry, Blood, Brain, *Chimpanzee, Computer, Data, Digital, Electroencephalogram (eeg), Environment, Flow, Learning, *Neurophysiology, Study, Training, Transducer, Waste.

For abstract, see S 04 20.

N66-35138 **Field 5J, 6S**
CFSTI Prices HC$2.00 MF$0.50
Wissenschaftliche Gesellschaft Fur Luft- Und Raumfahrt, Cologne (West Germany).
REPORT OF THE TECHNICAL COMMITTEE ANTHROPOTECHNIKS SESSION OF THE 25TH OF NOVEMBER IN BERLIN.
Bericht Ueber Die Sitzung Des Fachausschusses Anthropotechnik Am 25. November 1965 In Berlin
31 Jan 66, 38p DLR-MITT.-66-03
In German

Descriptors: Analysis, Anthropometry, Aspect, Central, Error, Human, *Human performance, Information, Machine, Man, *Man-machine system, Nerve, *Neurophysiology, Perception, Performance, Physiology, Pilot, Sensor, *Sensory perception, System.

For abstract, see S 04 20.

PB-170 834 **Field 5J, 5B**
CFSTI Prices: HC$1.10 MF$0.50
American Psychological Association, Washington, D. C. Project on Scientific Information Exchange in Psychology.
SCIENTIFIC COMMUNICATION: THE DISSEMINATION SYSTEM IN PSYCHOLOGY AND A THEORETICAL FRAMEWORK FOR PLANNING INNOVATIONS.
by William D. Garvey, and Belver C. Griffith. 1965, 8p
Grant NSF-GN-281
NSF Scientific Documentation Project. Published in American Psychologist v20 n2 p157-64 Feb 1965.

Descriptors: (*Psychology, *Information retrieval), Dissemination, Data processing systems, Symposia, Reports, Documentation, Management planning.

PB-170 835 **Field 5J, 5B**
CFSTI Prices: HC$1.60 MF$0.50
American Psychological Association, Washington, D. C. Project on Scientific Information Exchange in Psychology.
THE STRUCTURE, OBJECTIVES, AND FINDINGS OF A STUDY OF SCIENTIFIC INFORMATION EXCHANGE IN PSYCHOLOGY.
by William D. Garvey, and Belver C. Griffith. 1964, 11p
Grant NSF-G-18494
Published in American Documentation v15 n4 p258-67 Oct 1964. NSF Scientific Documentation Project.

Descriptors: (*Psychology, *Information retrieval), Data processing systems, Data storage systems, Reports, Symposia.

The general objective of the study was to develop a description of the scientific information exchange environment in psychology by determining the responsibilities of the persons and institutions associated with the origination, transmission, storage, and use of scientific information; the characteristics of the processes involved in the fulfillment of each of these functions and of the storage properties they afford; and, finally, the utilization of scientific information. To accomplish this objective sixteen specific studies were designed of which nine are available as technical reports. Findings trace the dissemination of information from initiation of research through archival publication (stressing that type of communication occurring at conventions); discuss access to and use of archival media; and determine the characteristics of

the user's behavior in his search for and use of needed information. (Author)

PB-170 838 **Field 5J**
CFSTI Prices: HC$1.10 MF$0.50
American Psychological Association, Washington, D. C. Project on Scientific Information Exchange in Psychology.
A LOOK AT CONVENTIONS AND WHAT THEY ACCOMPLISH.
by Bertita E. Compton. 1965, 8p
Grants NSF-G18494, NSF-GN-281
NSF Scientific Documentation Project. American Psychologist v21 n2 p176-83 Feb 1966.

Descriptors: (*Psychology, *Symposia), (*Information retrieval, Psychology), Effectiveness, Data, Dissemination.

A series of studies was developed which produced data, first, on the types of information displayed at some conventions of special importance to psychologists, those of APA. Trends in the selection of program material and in the types of programed events over a period of years, and something of the background of the persons who made convention presentations, were examined in this initial effort. Second, the investigation of the content of convention programs was extended to a consideration of presentations made at different types of meetings--state, regional, APA, and that of another national group. Data were gathered by means of questionnaires, and information on the content of convention presentations and upon plans for future dissemination of the same material was obtained. The educational status of the presenters of program material was also examined and, among those who presented work at national gatherings, any effects upon their work or plans resulting from making a convention presentation were determined. Third, and of greatest consequence, the characteristics of convention attendants and their use of the conventions as a means of acquiring scientific information were ascertained, also by questionnaire. (Author)

PB-170 839 **Field 5J, 5B**
CFSTI Prices: HC$1.10 MF$0.50
American Psychological Association, Washington, D. C. Project on Scientific Information Exchange in Psychology.
SCIENTIFIC INFORMATION EXCHANGE IN PSYCHOLOGY.
by William D. Garvey, and Belver C. Griffith.
1964, 5p
Grants NSF-G18494, NSF-GN-281
NSF Scientific Documentation Project. Pub. in Science v146 n3652 p1655-9 Dec 25 1964.

Descriptors: (*Psychology, *Information retrieval), Periodicals, Dissemination, Documentation.

PB-170 988 **Field 5J, 5B**
CFSTI Prices: HC$1.10 MF$0.50
American Psychological Association, Washington, D. C. Project on Scientific Information Exchange in Psychology.
THE CONVENTION PRESENTATION: INTERIM OR ULTIMATE TYPE OF DISSEMINATION.
by Bertita E. Compton. 1966, 3p APA-PSIEP-6
Grant NSF-G-18494
Rept. on NSF Scientific Documentation Project.

Descriptors: (*Psychology, *Information retrieval), Dissemination, Symposia, Effectiveness.

The data obtained in the study suggest that most material of value which is presented at conventions makes its way into the scientific literature during a 6 1/2-year interval which includes the months just preceding the convention as well as the years immediately following it. The authors of yet another small portion still entertain definite publication plans even after this length of time. There are, however, rather substantial numbers of presentations at conventions which not only do not find their way into the literature but are not considered worthy of archival preservation by their authors. The convention appears to play a threefold role in the dissemination of scientific information: (a) to announce the presence of current work, most of which will be accessible in complete and archivally published form within 2 years after the convention; (b) to serve to some extent as a filtering and refining process, making publication more easily achieved for those presentations of worthwhile content; and (c) to operate as a means of disseminating much work of possibly specialized and professional importance. (Author)

PB-172 897 **Field 5J**
CFSTI Prices: HC$3.00 MF$0.50
System Development Corp., Santa Monica, Calif.
EXPERIMENTAL STUDIES OF RELEVANCE JUDGMENTS:
Progress rept. no. 2.
by Carlos Cuadra. 1 Jul 66, 55p TM-3068/000/00
Contract NSF-C-424

Descriptors: (*Decision making, Analysis), Analysis of variance, Reasoning.

The variables studied thus far are: (1) Implicit Use Orientations, (2) Knowledgeability of Judges, (3) Forms of the Relevance Judgment, (4) Restrictions on the Shape of the Distribution, (5) Information Specificity of Stimulus Materials, (6) Sensitivity of Scale Forms to Range of Stimulus Values and to the Use of Judgmental Anchors, and (7) General Valuative Structure of the Articles Judged. All of the first five variables listed have been shown to influence relevance judgments. Analysis of data is still proceeding on the other two variables. (Author)

PB-173 154 **Field 5J**
CFSTI Prices: HC$2.00 MF$0.50
South Dakota Univ., Vermillion. Driver Behavior Lab.
VIGILANCE PERFORMANCE AS A FUNCTION OF SIGNAL LOCATION AND DISTANCE.
Final rept.
by Howard V. Jones. Aug 65, 31p Technical repts. TR-5, STS-0147
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Descriptors: (*Attention, Visual signals), (*Visual signals, Attention), Visual perception, Signal lights, Detection, Performance (Human), Functional analysis, Display systems.

The investigation consisted of two separate experiments. In the first experiment the effects of signal distance on vigilance performance was determined. Eighteen subjects were used. A subject viewed five banks of signal lights with each bank located progressively further from him. It was found that signal detection varied as a function of the distance it was located from the observer. Signals on the bank nearest the observer were missed less frequently than signals on the more distant banks. There was a direct relationship between the number of signals missed and the distance of the signals from the subject. The second experiment was concerned with vigilance performance in a situation where distance of the signal from the observer was constant but the location of signals varied in both a horizontal and vertical dimension. Eighteen subjects were tested. It was found that they missed more signals in peripheral locations and also more signals were missed that were placed in the upper level of the display. In both experiments, no relationship was found to exist between the amount of time a subject had spent in the vigilance session and location of the signal in terms of the probability of detecting a given signal. (Author)

PB-173 229 **Field 5J, 13L, 13B**
CFSTI Prices: HC$4.00 MF$0.75
Highway Research Board, Washington, D. C.
DRIVER CHARACTERISTICS, NIGHT VISIBILITY, AND DRIVING SIMULATION. ELEVEN REPORTS.
1963, 118p Record-25
Presented at the Annual Meeting (42nd), January 7-11, 1963.

Descriptors: (*Motor vehicle operators, Vision), Adaptation (Physiology), Night sky, Visibility, Simulation, Motor vehicle accidents, Safety, Behavior, Visual signals, Eyeglasses, Thresholds (Physiology).

CONTENTS: Perceptual and field factors causing lateral displacement; Driving behavior and related problems; A new method of measuring the effects of continued driving performance; Investigation of an intervehicle spacing display; Vision at levels of night road illumination; A hypereffective visual signal for night driving warning device; Tinted contact lenses-a handicap for night driving; Part-task simulation in driving research; Use of stress in part-task driving simulators-a preliminary study; Applications of the automobile simulator; Human thresholds related to simulation of inertia forces.

PB-173 230 **Field 5J, 13L, 13B**
CFSTI Prices: HC$3.00 MF$0.75
Highway Research Board, Washington, D. C.
DRIVING SIMULATION 1963. 6 REPORTS.
1964, 69p Record-55
Presented at the Annual Meeting (43rd), January 13-17, 1964.

Descriptors: (*Motor vehicle operators, Performance (Human)), Fatigue (Physiology), Simulation, Computers, Attention, Target recognition, Safety, Motor vehicle accidents, Traffic.

CONTENTS: Time sharing between compensatory tracking and search-and-recognition tasks; Effects of fatigue on basic processes involved in human operator performance; Computer simulation of the automobile driver; Development of the kaken driving simulator; Some criteria for priorities of research in driving simulation; Performance criteria--direct or indirect.

AD-638 770 **See Field 6P**

AD-638 815 **See Field 6P**

AD-639 031 **See Field 1B**

AD-639 033 **See Field 5I**

AD-639 066 **See Field 6E**

AD-639 086 **See Field 17B**

AD-639 088 **See Field 17B**

AD-639 103 **See Field 17B**

AD-639 104 **See Field 17B**

AD-639 125 **See Field 6P**

AD-639 141 **See Field 5I**

AD-639 142 **See Field 5I**

AD-639 143 **See Field 5E**

AD-639 144 **See Field 5E**

AD-639 225 **See Field 5I**

AD-639 237 **See Field 5I**

AD-639 238 **See Field 5I**

AD-639 286 **See Field 14B**

AD-639 296 **See Field 17I**

AD-639 358 **See Field 17C**

AD-639 359 See Field 17C

AD-639 379 See Field 14B

AD-639 380 See Field 17B

AD-639 383 See Field 17I

AD-639 392 See Field 5E

AD-639 523 See Field 6C

AD-639 580 See Field 6E

PB-173 159 See Field 13B

PB-173 168 See Field 13B

5K. SOCIOLOGY

PB-170 942 Field 5K
CFSTI Prices: HC$1.10 MF$0.50
Research Center for World Civilization, Freiburg im Breisgau (West Germany).
THE RESEARCH CENTER FOR WORLD CIVILIZATION.
1962, 11p
NSF Scientific Documentation Project.

Descriptors: (*Culture, Sociometrics), (*Sociology, Scientific research), Scientific organizations, Documentation, West Germany.

The study is centered primarily on the phenomena of social and cultural change in non-European countries, but it also takes into consideration the phenomena of change in Eastern and Western Europe and in America. It is to the impact of European-American culture that the traditions of non-European cultures have been subjected. While exerting this influence, European-American culture is itself undergoing universal and fundamental changes as a result of the revolutions in the course of the 19th Century. It is carrying the problems of this process into the non-European cultures. On the other hand, the social and cultural change in the whole world again influences European-American culture. In order to avoid a Europe-centered misinterpretation of the phenomena of world-wide social and cultural change, the different cultures are studied not only under the aspects of their receptivity but also of their activity within the process of global change.

AD-639 128 See Field 5C

AD-639 429 See Field 5G

AD-639 569 See Field 5C

AD-639 611 See Field 5I

PB-170 402 See Field 1E

6. BIOLOGICAL AND MEDICAL SCIENCES

N66-25306 Field 6
CFSTI Prices HC$4.00 MF$1.00
National Aeronautics And Space Administration, Washington, D. C.
AEROSPACE MEDICINE AND BIOLOGY - A CONTINUING BIBLIOGRAPHY, MARCH 1966.
Apr 66, 143p NASA-SP-7011/23/

Descriptors: Abstract, Aerospace, *Aerospace medicine, Animal, Annotation, *Bibliography, *Bioastronautics, Biological, Biology, Effect, Environment, Exobiology, Life, Man, Medicine, Pharmacology, Physiology, Psychology, Safety, Sanitation, Space, Support, Survival, System, Toxicology.

For abstract, see S 04 13.

N66-34669 Field 6
CFSTI Prices HC$1.00 MF$0.50
Maryland Univ., College Park.
MICROWAVE MEASUREMENT OF PROTEIN HYDRATION AND OF END GROUP CHARGE ACTIVITY PROGRESS REPORT, 1 FEB. - 31 JUL. 1966.
1966, 25p NASA-CR-77238
Contract NGR-21-002-040

Descriptors: *Anisotropy, Apparatus, Cavity, Chamber, Control, Design, Dielectric, End, Environment, Frequency, Group, *Hydration, Instrument, Macromolecule, Measurement, *Measuring apparatus, Microwave, *Microwave frequency, Physiology, *Protein, Structure, Water.

For abstract, see S 04 20.

PB-170 840 See Field 5B

6A. BIOCHEMISTRY

AD-638 755 Field 6A
CFSTI Prices: HC$1.00 MF$0.50
Medical Research Lab., Edgewood Arsenal, Md.
EFFECT OF ACETIC ANHYDRIDE IN ANHYDROUS DIOXANE ON C-TERMINAL RESIDUES OF PEPTIDES.
Technical rept., Mar-Jun 64.
by Norwood K. Schaffer, and R. A. Balakir. Sep 66, 9p
Proj. DA-1L013001A91A
EATR-4038

Descriptors: (*Peptides, Chemical analysis), (*Acetic anhydrides, Chemical reactions), Polymers, Proteins, Amino acids, Organic solvents, Hydrolysis.

The reaction of 20 dipeptides, 2 tripeptides, and 1 heptapeptide with acetic anhydride in anhydrous dioxane was studied. After 6N HCl hydrolysis the yield of the C-terminal residue was less than that of the penultimate residue in all peptides except three of the dipeptides. The yield of the penultimate residue in the two tripeptides was less than that of the N-terminal residue. Tyrosyl arginine yielded ornithine to partly account for the lost arginine. These results suggest that the acetic anhydride-dioxane reaction can be used as a subtractive method for identifying C-terminal amino acid residues in some peptides. (Author)

AD-638 765 Field 6A
Not available from CFSTI.
Columbia Univ., New York. Dept. of Microbiology.
THE ACTION OF CHYMOTRYPSIN ON TWO NEW CHROMOGENIC SUBSTRATES.
by Bernard F. Erlanger, Frances Edel, and A. G. Cooper. 31 Jan 66, 6p
Contract Nonr-266 (73), Grant PHS-GM-11805-07
Availability: Published in Archives of Biochemistry and Biophysics v115 n1 p206-10 1966.

Descriptors: (*Chymotrypsin, *Chemical indicators), (*Organic nitrogen compounds, Chemical indicators), Hydrolysis, Colorimetric analysis, Electrolytes, Sodium, Calcium, Reaction kinetics, Microanalysis, Phenylalanine.

Identifiers: Glutaryl phenylalanine nitroanilides, Succinyl phenylalanine nitroanilides.

Two new chromogenic substrates of chymotrypsin have been synthesized: N-succinyl-L-phenylalanine p-nitroanilide (SPNA) and N-glutaryl-L-phenylalanine p-nitroanilide (GPNA). Both are stable in the absence of enzyme and release p-nitroaniline (yellow) upon hydrolysis. GPNA is the more sensitive substrate being capable of quantifying less than 10 micrograms per milliliter chymotrypsin. The presence of Ca (++) decreases Km of the enzyme-substrate reaction but has a negligible effect upon k3. Na (++), on the other hand, increases k3 as well, and provides a suitable means of increasing the sensitivity of GPNA down to microgram levels of enzyme. In combination with an 'all or none' assay the rate of hydrolysis of GPNA can be related to the molar concentration of enzyme. The reaction of chymotrypsin with GPNA is not subject to substrate activation over a 200-fold range of substrate concentration, nor is it affected by the presence of ethyl ammonium chloride. In these respects it differs from the reaction of trypsin with susceptible substrates. (Author)

AD-638 771 Field 6A, 6E
Not available from CFSTI.
California Univ., San Francisco. Medical Center.
THE QUANTITATIVE ESTIMATION OF ALPHA2-MACROGLOBULIN IN NORMAL, PATHOLOGICAL AND CORD SERA.
by K. James, Gloria Johnson, and H. H. Fudenberg. 2 Dec 65, 8p
Contract Nonr-3656 (12), Grant PHS-AM-08527
Proj. NR-105-308
Availability: Published in Clinica Chimica Acta v14 p207-14 1966.

Descriptors: (*Globulins, Quantitative analysis), Blood serum, Diseases, Pathology, Adults, Infants, Males, Females, Pregnancy, Serodiagnosis, Antigens + antibodies, Deficiency diseases, Gamma globulin, Cardiovascular diseases, Mental disorders, Rheumatic diseases, Respiratory diseases, Diabetes, Skin.

The alpha2-macroglobulin content of normal, pathological and cord sera was estimated by an antibody-agar radial diffusion procedure (employing alpha2-macroglobulin standards) which gives highly reproducible results (100 plus or minus 2.2%). A significant difference ($P < 0.05$) was observed between the serum alpha2-macroglobulin levels of normal Caucasian men (265 plus or minus 55 mg/100 ml) and women (335 plus or minus 57 mg/100 ml). In men, the serum concentration of alpha2-macroglobulin was greatly increased in ataxia telangiectasia, atopic dermatitis and mongolism and was significantly elevated in pulmonary disorders, diabetes mellitus and agammaglobulinemia. Values were significantly decreased in multiple myeloma and slightly decreased in rheumatoid arthritis. In women, serum concentrations were markedly increased in ataxia telangiectasia, atopic dermatitis and mongolism and were significantly decreased in severe rheumatoid arthritis, macroglobulinemia and multiple myeloma. No significant differences were observed in the limited number of sera from women with pulmonary disorders or agammaglobulinemia. (Author)

AD-638 779 Field 6A
Not available from CFSTI.
Lobund Inst., Univ. of Notre Dame, Ind.
THE PROTEASES, AMYLASE AND LIPASE OF THE PANCREAS AND INTESTINAL CONTENTS OF GERM-FREE AND CONVENTIONAL RATS.
Revised ed.
by S. Lepkovsky, F. Furuta, K. Ozone, M. Wagner, and T. Koike. 3 Oct 65, 5p
Contract Nonr-1623 (04)
Revision of manuscript submitted 6 Aug 65. Prepared in cooperation with California Univ., Berkeley. Dept. of Poultry Husbandry. Research supported in part by PHS, NIH, and NSF.
Availability: Published in Br. J. Nutr. v20 p257-61 1966.

Descriptors: (*Germ-free animals, *Enzymes), (*Pancreas, Enzymes), (*Intestines, Enzymes), Peptide hydrolases, Glycoside hydrolases, Nitrogen, Bacteria, Rats.

Identifiers: Lipases, Non-protein nitrogen.

Measurements were made of the proteases, amylase and lipase of the pancreas and of the corresponding intestinal, caecal and colonic contents of germ-free and conventional rats. Little difference was found between the concentration of the enzymes in the germ-free and conventional rats

The results indicate that intestinal bacteria had only a minor part in determining the fate of the pancreatic enzymes in the contents of the intestine, caecum and colon. The enzyme concentrations decreased caudally. The proteases were the most stable, and the amylase was the least stable; the stability of lipase was intermediate between that of the proteases and amylase. Evidence of bacterial activity in the caecal contents of conventional rats was seen in the greater percentage of protein nitrogen and in the lower percentage of the non-protein nitrogen. (Author)

AD-638 788 **Field 6A, 6T, 6M**
CFSTI Prices: HC$1.00 MF$0.50
Edgewood Arsenal, Md. Biophysics Lab.
MORPHOLOGICAL AND BIOCHEMICAL EFFECTS OF CLOSTRIDIUM PERFRINGENS ALPHA TOXIN ON INTACT AND ISOLATED SKELETAL-MUSCLE MITOCHONDRIA.
Technical rept., Aug 65-Apr 66.
by I. William Grossman, Dale H. Heitkamp, and Bertram Sacktor. Sep 66, 19p
Proj. DA-1M012501A027
EATR-4028

Descriptors: (*Mitochondria, Toxins + antitoxins), (*Clostridium perfringens, Toxins + antitoxins), (*Cytochemistry, *Toxins + antitoxins), Musculoskeletal system, In vivo analysis, In vitro analysis, Phospholipids, Hydrolysis, Oxidoreductases, Rabbits.

Electron-dense deposits were observed in skeletal-muscle mitochondria exposed in vivo and in vitro to a partially purified Clostridium perfringens alpha toxin. Depressed oxidative functions in the toxin-exposed, isolated mitochondria were concomitant with the electron-dense deposits. The mitochondria are suggested as the cellular site of action of the alpha toxin. (Author)

AD-638 823 **Field 6A**
Not available from CFSTI.
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
ULTRAVIOLET LIGHT IRRADIATED COLLAGEN MACROMOLECULES.
Physical sciences research papers.
by Eiji Fugimori. 22 Mar 65, 10p AFCRL-66-508, AFCRL-PSRP-250
Proj. AF-8659
Task 865903
Presented at International Photobiology Congress (4th), Oxford, England, July 26-30 1964.
Availability: Published in Biochemistry v5 n3 p1034-40 Mar 1966.

Descriptors: (*Collagen, *Ultraviolet radiation), Photochemistry, Absorption spectrum, Tyrosine, Phenylalanine, Fluorescence.

Collagen macromolecules undergo photopolymerization when irradiated with ultraviolet light of 2537 A. The absorption spectrum of irradiated collagen shows an increase in extinction at the longer wavelengths (290-400 mM). The decrease of ultraviolet fluorescences due to phenylalanine and tyrosine is accompanied by the concomitant appearance of new blue fluorescences excited at 350 mM. Although the ultraviolet fluorescences of tyrosine and phenylalanine decrease uniformly with an increase in temperature, the intensity of the blue fluorescences shows an anomalous rise in the temperature range from 30 to 40 degrees. This temperature range corresponds to that of a helix to random-coil transition as shown in the change of viscosity, optical rotation, and far-ultraviolet absorption. This transconformation temperature is lower in irradiated collagen than native collagen. The specific optical levorotation of irradiated collagen is greater than that of native collagen. Irradiated collagen is still able to form segment-long-spacing-like aggregates, even though the ability to form native fibers is lost. These studies show that the blue fluorescences result from the photoproducts of phenylalanine and tyrosine. These photoproducts are probably integral parts of the new linkages. The blue fluorescences are dependent on the structural conformation of a helical rigid body which is not seriously damaged by radiation. (Author)

AD-638 879 **Field 6A, 6S**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
EFFECT OF VITAMIN B1 ON THE ACTIVITY OF SALIVARY AND INTESTINAL GLANDS IN ANOXIA CONDITIONS.
by S. I. Filippovich. 25 Apr 66, 9p FTD-TT-65-1647
TT-66-62229
Unedited rough draft trans. of Byulletin Eksperimentalnoi Biologii i Meditsiny (USSR) n11 p387-9 1948.

Descriptors: (*Digestive system, *Anoxia), (*Vitamin B complex, Anoxia), Intestines, Salivary glands, Saliva, Secretion, Gastrointestinal system, Dogs, Humans, USSR.

AD-638 899 **Field 6A, 6S**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
EFFECT OF ASCORBIC ACID ON THE ACTIVITY OF SALIVARY AND INTESTINAL GLANDS IN CONDITIONS OF ANOXIA.
by S. I. Filippovich. 18 Apr 66, 11p FTD-TT-65-1646
TT-662238
Unedited rough draft trans. of Byulleten' Eksperimentalnoi Biologii i Meditsiny (USSR) n8 p99-102 1948.

Descriptors: (*Digestive system, *Anoxia), (*Ascorbic acid, Anoxia), Intestines, Salivary glands, Saliva, Secretion, Gastrointestinal system, Dogs, Humans, USSR.

AD-638 958 **Field 6A, 7D**
Not available from CFSTI.
San Francisco Univ., Calif. Inst. of Chemical Biology.
QUALITY TESTING OF CHROMATOGRAPHIC DATA WITH THE AID OF A STATISTICAL CRITERION.
by George Ledin Jr, Waldemar R. Gustavson, and Arthur Furst. 22 Oct 65, 9p
Contract AF 33 (615)-2332
Proj. AF-6302
Task 630202
AMRL-TR-66-132
Availability: Published in Journal of Chromatography v22 n2 p376-380 May 1966.

Descriptors: (*Chromatographic analysis, *Statistical tests), Errors, Vitamin B complex, Amines, Phosphates, Separation.

Identifiers: Pyridoxamine phosphates.

Testing the reproducibility of chromatographic data with the usual statistical tests (t-Student's, Chi-Square, etc.) is in most cases a time-consuming error-inviting procedure. The criterion developed in this paper allows the experimenter to obtain a good estimate of the confidence bounds by applying an extremely simple test. Two examples involving the RF values of pyridoxamine-5PO4 illustrate the method. (Author)

AD-638 990 **Field 6A, 6E, 6P**
CFSTI Prices: HC$6.00 MF$1.25
Army Medical Research and Nutrition Lab., Denver, Colo.
ANNUAL RESEARCH PROGRESS REPORT, 1 JULY 1965 - 30 JUNE 1966.
30 Jun 66, 243p

Descriptors: (*Nutrition, Medical research), Military medicine, Biochemistry, Metabolism, Lipids, Carbohydrates, Amino acids, Proteins, Fats, Colloids, Muscles, Surgery, Histology, Pathology, Bacteria, Lungs, Public health, Diseases, Mycobacterium tuberculosis, Laboratory animals, Transplantation, Cardiovascular system, Parenteral infusions, Irradiated foods, Wounds + injuries, Kealing.

Studies of performance physiology, molecular biochemistry, lipid nutrition and metabolism, mineral metabolism and carbohydrates were conducted during the period and findings in each field are reported. Experimental surgery, histopathology and clinical pathology of lab animals; nutritional and metabolic adaptations, amino acids and proteins, carbohydrates, body composition and muscle metabolism were studied utilizing humans, dogs and small laboratory animals using various techniques. Research was conducted under the following work units during the past year: Symbiosis and intestinal flora in nutrition; protein chemistry; microbial metabolism; tissue transplantation; regulation of thyroid function and cardiovascular research. Biomedical studies include tuberculosis research, computer classification of pulmonary disability, wound healing, effects of INH on murine pulmonary histology, intravenous fat emulsion, nutritional studies of populations, radiated foods, micronutrients and nutritional physiology.

AD-638 991 **Field 6A**
CFSTI Prices: HC$3.00 MF$0.50
Feltman Research Labs., Picatinny Arsenal, Dover, N. J.
AN INVESTIGATION OF BIOLOGICAL SYSTEMS BY SLOW NEUTRON INELASTIC SCATTERING.
Technical rept.
by H. P. Boutin. Sep 66, 58p
Proj. DA-1C014501A32B01
PA-TR-3367
Supported in part by Army Biological Labs., Frederick, Md.

Descriptors: (*Peptides, Neutron scattering), (*Glutamic acid, Neutron scattering), (*Glycines, Neutron scattering), Nuclear spectroscopy, Serum albumin, Phonons, Amides, Amino acids.

Identifiers: Leucine, Keratin.

Several systems of biological interest have been investigated by slow neutron inelastic scattering. The frequencies of molecular vibrations in a 40-800/cm range have been obtained for several polypeptides (polyglutamic acid (PGA), polyglycine, polyleucine). Under certain approximations, the frequency distribution g (mu) of phonons in the sample can be extracted from the scattered neutron intensity. This function g (mu) can in turn be used to calculate some of the thermodynamic parameters such as free energy, enthalpy, or specific heat. This has been applied to the study of the alpha-helix-random coil transition in PGA, and to the denaturation of bovine serum albumin (BSA). Preliminary results on the 'melting' of keratin structure in 7-8 LiBr solution are also presented. (Author)

AD-639 080 **Field 6A**
Not available from CFSTI.
Walter Reed Army Inst. of Research, Washington, D. C. Div. of Biochemistry.
INCORPORATION OF DIETARY ELAIDIC ACID IN TISSUES AND EFFECTS ON FATTY ACID DISTRIBUTION.
by Walter J. Decker, and Walter Mertz. 17 Dec 65, 6p
Availability: Published in Journal of Nutrition v89 n2 p165-70 Jun 1966.

Descriptors: (*Fatty acids, Diet), (*Nutrition, Fatty acids), Lipids, Liver, Mitochondria, Tissues (Biology), Molecular isomerism, Erythrocytes.

The incorporation of dietary elaidic acid into rat tissue and its effect on fatty acid distribution was studied with the use of infrared spectrophotometry and gas-liquid chromatography. Elaidic acid was incorporated into all of the 3 types of tissue analyzed, epididymal fat pad, liver mitochondria, and

erythrocyte stroma. The patterns of tissue distribution of elaidic acid and other fatty acids were different in the 3 tissues; depot fat resembled the dietary lipid more closely than did erythrocyte or mitochondrial lipid. Traces of trans isomers of unsaturated fatty acids were present in tissue from rats receiving no detectable amount of these acids in the diet. (Author)

AD-639 081 **Field 6A**
Not available from CFSTI.
Walter Reed Army Inst. of Research, Washington, D. C. Div. of Communicable Disease and Immunology.
EFFECT OF pH ON HUMAN COMPLEMENT ACTIVITY.
by Bernard J. Fogel, William A. Hook, and Earl H. Fife. 1966, 2p
Availability: Published in Nature v210 n5043 p1381 Jun 25 1966.

Descriptors: (*Complement, pH), Hemolysis, Acid-base equilibrium, Immunology, Humans, Guinea pigs.

The influence of pH on the haemolytic activity of human complement (HuC') was investigated over the pH range 5.55-8.20. Maximum haemolytic activity of HuC' was observed at pH 6.77 and not at the pH level (7.2) usually used. Adjustment of pH to either the acid or alkaline side of pH 6.77 resulted in reduced HuC' titres. These observations paralleled the findings of Ibe and Wardlaw in which it was demonstrated that in the case of guinea-pig C' (GpC'), maximum haemolytic activity was manifested at pH 6.8. Both studies corroborate and extend the observations of Kabat and Mayer, who noted that the haemolytic activity of GpC' progressively increased as the pH of the system was reduced from 8.52 to 7.15. However, the latter investigators did not present data concerning the effects of lower pH values on immune haemolysis. In view of the present findings, consideration should be given to the potential value of conducting tests involving guinea-pig and human C' at pH 6.8 rather than using the more generally used pH 7.2. (Author)

AD-639 136 **Field 6A, 6C**
Not available from CFSTI.
Prairie Regional Lab., Saskatoon (Saskatchewan).
BIOSYNTHESIS OF MUSTARD OIL GLUCOSIDES.
by E. W. Underhill, and L. R. Wetter. 1966, 10p
NRC-8870
Availability: Published in Biosynthesis of Aromatic Compounds, Proceedings of the Meeting of the Federation of European Biochemical Societies (2nd) v3 p129-37 1966.

Descriptors: (*Glycosides, Biosynthesis), (*Vegetable oils, Glycosides), (*Plants (Botany), Metabolism), Molecular structure, Tracer studies, Organic sulfur compounds, Organic nitrogen compounds, Reviews, Canada.

Identifiers: Mustard oils.

AD-639 148 **Field 6A**
Not available from CFSTI.
Atlantic Regional Lab., Halifax (Nova Scotia).
OCCURRENCE OF METABOLICALLY-ACTIVE BOUND FORMS OF CINNAMIC ACID AND ITS PHENOLIC DERIVATIVES IN ACETONE POWDERS OF WHEAT AND BARLEY PLANTS.
by Said Z. El-Basyouni, and A. C. Neish. 20 Oct 65, 10p
NRC-8909
Availability: Published in Phytochemistry v5 p683-91 1966.

Descriptors: (*Cereals, Tissue extracts), (*Carboxylic acids, Plants (Botany)), Phenols, Tracer studies, Metabolism, Decomposition, Labeled substances, Lignin, Anthoxanthin pigments, Biosynthesis, Wheat, Canada.

Identifiers: Barley, Caffeic acids, Cinnamic acids, Coumaric acids, Ferulic acids.

Acetone powders of wheat and barley shoots contain bound forms of cinnamic, p-coumaric, caffeic and ferulic acids. The free acids can be released by an enzymatic autolysis as well as by the action of acids and alkali. The bound forms can be extracted by cold buffer and a preliminary fractionation by ammonium sulphate precipitation and gel filtration on Sephedax shows some association with the protein fractions. Photosynthesis in 14CO2 (2 hr) or feeding of 14C-labelled phenylalanine prior to preparation of the acetone powder caused a rapid labelling of the bound cinnamic acids thus showing them to be metabolically active. Analysis of the degree of labelling supports the sequence: cinnamic acid to p-coumaric acid to caffeic acid to ferulic acid. Differential autolysis showed that several bound forms of cinnamic and ferulic acid were present. It is suggested the actual pool of phenylpropanoid intermediates involved in the biosynthesis of lignin and related compounds is to be found in these acetone-insoluble cinnamic acid derivatives. (Author)

AD-639 149 **Field 6A**
Not available from CFSTI.
British Columbia Univ., Vancouver. Dept. of Botany.
PHENOLIC ACIDS AND PHENOLIC GLYCOSIDES OF GAULTHERIA SPECIES.
by G. H. N. Towers, Aida Tse, and W. S. G. Maass. 24 Nov 65, 6p
Prepared in cooperation with Atlantic Regional Lab., National Research Council of Canada, Halifax, Nova Scotia.
Availability: Published in Phytochemistry v5 p677-81 1966.

Descriptors: (*Plants (Botany), Acids), Phenols, Alcohols, Salicylic acids, Glycosides, Benzoic acids, Canada.

Identifiers: Hydroxybenzoic acids, Pyrocatechols, Coumaric acids, Caffeic acids, Ferulic acid.

Twenty-two species of Gaultheria were examined for phenols and phenolic acids obtained by hydrolysis of ethanolic extracts. Most species yielded p-hydroxybenzoic, o-pyrocatechuic, protocatechuic, gentisic, vanillic, p-coumaric, caffeic and ferulic acids. Thirteen species contained derivatives of salicylic acid as well; the glycoside gaultherin was isolated from two of these. The three species of the section Amblyandra yielded catechol as the major phenol in hydroyzates of ethanolic extracts. Catechol-beta-D-glucopyranoside was isolated from one of these. The relationship of these phenolic compounds to one another is discussed. (Author)

AD-639 188 **Field 6A, 6E**
CFSTI Prices: HC$1.00 MF$0.50
School of Aerospace Medicine, Brooks AFB, Tex.
LIPID COMPONENTS OF SOUND AND CARIOUS DENTIN.
by Thomas R. Dirksen. 27 Oct 61, 5p Rept. no. 62-47
Presented at meeting of Int. Assoc. for Dental Research (39th), Boston, Mass. 23-26 Mar 61.

Descriptors: (*Lipids, *Teeth), Diseases, Chromatographic analysis, Cholesterol, Esters, Fats, Fatty acids, Phospholipids, Inositols, Phosphates, Degradation.

To further characterize the lipid components of sound and carious dentin, alcohol-ether extracts of these materials were subjected to paper chromatography and specific chemical tests. The presence of cholesterol esters, triglycerides, fatty acids, cholesterol, diglycerides, and various phospholipids was demonstrated in the sample materials. Sound dentin was found to contain inositol phosphatide, sphingomyelin, lecithin, and two unidentified phosphatides which are believed to be polyglycerol phosphatides and phosphatidic acids. Decayed material contained sphingomyelin, lecithin, phosphatidylethanol amine, and phosphatidylserine, and other phosphatides which had undergone various degrees of degradation. (Author)

AD-639 239 **Field 6A**
CFSTI Prices: HC$1.10 MF$0.50
Naval Medical Research Lab., New London, Conn.
INTRADERMAL INJECTION OF 2, 6 DICHLOROBENZENONE INDOPHENOL FOR THE TISSUE LEVEL DETERMINATION OF ASCROBIC ACID.
Memo rept.
by John S. Lindsay, and Arne G. Nielsen. 19 Apr 62, 10p MR-62-4
NAVMED-MR005.12-5220-3.03

Descriptors: (*Ascorbic acid, *Diagnostic agents), Dyes, Tissues (Biology), Deficiency diseases, Statistical analysis.

Identifiers: Dichlorobenzenone indophenol.

Research was performed to determine the statistical reliability of a single dye test for the estimation of individual Vitamin-C status, and to determine the range and variability in a group of presumably healthy subjects. Statistical reliability of single dye tests for the estimation of individual Vitamin-C level was found to be below acceptable limits for biological measurements, but it is felt that such tests may be useful for screening patients at the extremes of ascorbic acid tissue levels. It was indicated that intradermal dye test is an acceptable index for the estimation and comparison of group ascorbic acid tissue levels. (Author)

AD-639 241 **Field 6A**
CFSTI Prices: HC$1.00 MF$0.50
Army Medical Research and Nutrition Lab., Denver, Colo.
HUMAN BODY DENSITY AND FAT OF AN ADULT MALE POPULATION AS MEASURED BY WATER DISPLACEMENT.
by Harry J. Krzywicki, and Kenneth S. K. Chinn. 21 Jul 66, 16p Rept. no. 297
Proj. DA-3A014501B71R
Task 92

Descriptors: (*Body, *Lipids), Body weight, Aging (Physiology), Volume, Density, Anthropometry, Males.

Body volume was measured on 14 male adults at 7 intervals during a 24 hour period using a water displacement technique. The variation in body densities fell within the accepted limits of error propagated by the technique. Body densities were also performed on 173 male adults ranging between the ages of 17-69. Values were effectively ranked in terms of age and body fat, demonstrating a continued increase in body fat with an increase in age. These values were independent of body weight. The human body volumeter is a simple, rapid and effective device which compares favorably with the underwater weighing technique for estimating body density in large populations. The precision for estimating body fat is ;0.488 kg when the residual lung volume is measured but is reduced to 1.52 kg when the volume is estimated. (Author)

AD-639 332 **Field 6A, 6E**
Not available from CFSTI.
University Coll. of East Africa, Kampala (Uganda).
SOME PATTERNS OF URINARY IODINE EXCRETION IN UGANDA.
by Richard H. Follis Jr, and Daniel H. Connor. 18 Aug 65, 6p
Grant DA-MD-49-193-62-G56
Prepared in cooperation with Armed Forces Inst. of Pathology, Washington, D. C.
Availability: Published in East African Medical Journal p114-8 Apr 1966.

Descriptors: (*Iodine, Excretion), (*Deficiency diseases, Africa), Nutrition, Diet, Thyroid gland, Urine.

Identifiers: Creatinine.

The concentrations of iodine in the urine in terms of creatinine content of a casual specimen have been presented from six sites in Uganda and compared with data obtained in Washington, D.C. and other areas throughout the world. At several sites in Uganda low excretion patterns were found which are interpreted to indicate low dietary iodine intake. (Author)

AD-639 459 **Field 6A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
THE PRESENCE OF TWO LIGHT-DEPENDENT ENZYMATIC PROCESSES ACCOMPANYING FLUORESCENCE DECAY IN WHEAT LEAVES DURING PHOTOSYNTHESIS.
by Pei-chien Chow, See-ching Lin, Zhung-chee Chu, Ko-fa Shien, and Pei-sung Tang. 15 Jun 66, 13p FTD-TT-65-1091
TT-66-62342
Edited trans. of Chih Wu Hsueh Pao (Chinese People's Republic) v12 n1 p82-7 1964.

Descriptors: (*Photosynthesis, Fluorescence), (*Chlorophylls, Fluorescence), Enzymes, Wheat, Temperature, Intensity, Phosphorylation, China.

The leaves of wheat sprouts (Agricultural University variety 183) were used as the object of experimentation, and the variation of the time curve of chlorophyll fluorescence during the initial period of illumination was determined. Under the influence of various temperatures, fluorescence decay was found to be hastened by increasing temperatures within a definite range; in addition, there was the phenomenon of a later fluorescence intensity increase known as the second rise. The occurrence of the second rise has a definite relation to temperature; fluorescence decay disappears after a 10-minute treatment at a temperature of 45C; after decay, leaves can recover fluorescence intensity in darkness, the degree of restoration being directly proportional to the period of time in darkness. The following results were obtained from the inhibitor experiments: sodium azide, potassium cyanide and DNP have little effect on the first rise, but an inhibitory effect on the second rise; malonate greatly affects the decrease of the first rise, but altogether lacks inhibitive effect on the second rise; succinate and fumarate have a restoring effect on the inhibition by malonate. It is possible that the decrease of the first rise has a definite relation to the tricarboxylic acid cycle, whereas the second rise may have something to do with the cellular pigmentation system and phosphorylation. (Author)

AD-639 477 **Field 6A**
Not available from CFSTI.
Edsel B. Ford Inst. for Medical Research, Detroit, Mich.
FUMARATE REDUCTASE, SUCCINATE AND NADH DEHYDROGENASES OF YEAST: PROPERTIES AND BIOSYNTHESIS.
by Thomas P. Singer, Eugenio Rocca, and Edna B. Kearney. 1966, 36p
Contract Nonr-1656 (00), Grant NIH-HE-01995
Grant NSF-GB-1905.
Availability: Published in Flavins and Flavoproteins p392-426 1966.

Descriptors: (*Yeasts, *Oxidoreductases), Biosynthesis, Mitochondria, Anthoxanthin pigments, Mitosis, Oxygen, Metabolism, Antimetabolites, Cytochrome oxidase, Reviews.

Identifiers: Fumarate reductase, Succinic dehydrogenase, Nicotinamide adenine dinuclective dehydrogenase.

AD-639 505 **Field 6A**
Not available from CFSTI.
Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Biophysics.
USE OF POLY-ALPHA-AMINO ACIDS IN BIOLOGICAL STUDIES.
by Ephraim Katchalski. 1965, 38p
Grant AF-EOAR-59-63
Proj. AF-9777
Task 977701
AFOSR-66-0288
Availability: Published in The Harvey Lectures Ser59 p243-78 1965.

Descriptors: (*Amino acids, Proteins), Israel, Polymers, Peptides, Synthesis (Chemistry), Peptide hydrolases, Genetics, Ribonucleic acids, Biology.

Identifiers: Lysines.

Polyamino acids have been useful in the elucidation of the mode of action of known proteolytic enzymes, as well as in the search for new proteolytic enzymes. The work performed using synthetic polypeptide antigens has contributed much to knowledge of the factors determining antigenicity of proteins. The close resemblance between the antibacterial and antiviral properties of basic polyamino acids and some natural peptides indicates that both the synthetic model compounds and the natural materials may act biologically by a similar mechanism. Basic polyamino acids may prove to be useful in the clarification of the role of the basic protamines and histones in regulating chromosome activity. In view of the achievements attained with simple high molecular weight model compounds, it might be anticipated that when the organic chemists have a large number of synthetic high molecular weight polypeptides of a predetermined amino acid sequence, these macromolecules will be of even greater use than the polyamino acids in unraveling the secrets of protein molecules and in establishing the correlation between their structure and function. (Author)

AD-639 506 **Field 6A**
Not available from CFSTI.
Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Biophysics.
A WATER-INSOLUBLE POLYANIONIC DERIVATIVE OF TRYPSIN. II. EFFECT OF THE POLYELECTROLYTE CARRIER ON THE KINETIC BEHAVIOR OF THE BOUND TRYPSIN.
by Leon Goldstein, Yehuda Levin, and Ephraim Katchalski. 14 Aug 64, 9p
Grants AF-EOAR-59-63, PHS-AM-03083
Proj. AF-9777
Task 977701
AFOSR-66-0291
Prepared in cooperation with Hebrew Univ., Jerusalem (Israel), Dept. of Biological Chemistry. See also AD-633 330.
Availability: Published in Biochemistry v3 n12 p1913-9 Dec 1964.

Descriptors: (*Trypsin, Electrolytes), Polymers, Chemical bonds, Reaction kinetics, pH, Concentration (Chemistry), Electrostatics, Peptides, Israel.

The mode of action of the water-insoluble derivatives of trypsin (IMET), obtained by the covalent binding of trypsin to a copolymer of maleic acid and ethylene (1:1) was investigated at 25C. The pH-activity profile of IMET at low ionic strength, using benzoyl-L-arginine ethylester as substrate, was found to be displaced by approximately 2.5 pH units toward more alkaline pH values, when compared with trypsin under similar conditions. At higher ionic strength, the pH-activity curve of IMET shifted toward more acid pH values, approaching the pH-activity curve of IMET-trypsin. The Michaelis constant measured for the benzoyl-L-arginine amide system at low ionic strength and optimal pH was found to be approximately thirty times lower than that of the trypsin-benzoyl-L-arginine amide system, at its optimal pH. The Michaelis constant at high ionic strength, measured for the IMET-benzoyl-L-arginine amide system at the pH of optimal activity, approached that for the trypsin-benzoyl-L-arginine amide system when measured at its optimal pH and the same ionic strength. Theoretical analysis of the kinetic data allowed a quantitative correlation of the displacement in the pH-activity curves and the shifts in the Michaelis constants with the electrostatic potential prevailing in the domain of the polyelectrolyte carrier. (Author)

AD-639 512 **Field 6A, 6M, 6O**
Not available from CFSTI.
Centre National de la Recherche Scientifique, Gif-sur-Yvette (France). Laboratoire d'Enzymologie Microbienne.
EFFET DE L'ACTINOMYCINE D SUR LA SYNTHESE INDUITE DE LA BETA-GALACTOSIDASE ET LA SYNTHESE DU RNA SPECIFIQUE PAR UNE FRACTION SUBCELLULAIRE D'ESCHERICHIA COLI K-12 (Effect of Actinomycin D on the Induced Synthesis of beta Galactosidase and the Synthesis of RNA Specific for a Subcellular Fraction of Escherichia coli K-12).
by Bention Nisman, Jean Pelmont, Josette Demailly, and M. Alexandre Yapo. 1963, 4p
Grant AF-EOAR-62-50
Text in French.
Availability: Published in C. R. Acad. Sc., v256 p523-6 Jan 7 1963.

Descriptors: (*Enzyme inhibitors, *Antibiotics), (*Ribonucleic acids, Biosynthesis), Escherichia coli, Enzymes, In vitro analysis, France.

Identifiers: Actinomycins.

AD-639 513 **Field 6A, 6M, 6O**
Not available from CFSTI.
Centre National de la Recherche Scientifique, Gif-sur-Yvette (France). Laboratoire d'Enzymologie Microbienne.
ISOLEMENT PAR SONNATION A PARTIR DU SYSTEME PARTICULAIRE P1 D'ESCHERICHIA COLI D'UNE FRACTION DE FRAGMENTS DE MEMBRANE ESSENTIELLE POUR L'INDUCTION DE LA BETA-GALACTOSIDASE IN VITRO (Sound Induced Separation, beginning with the Particulate System P1 of Escherichia coli, of a Fraction of the Membranous Fragments Essential for Inducing Beta Glactosidase In Vitro.
by Benton Nisman, Jean Pelmont, Josette Demailly, and Alexandre Yapo. 1963, 4p
Grant AF-EOAR-62-50
Text in French.
Availability: Published in C. R. Acad. Sc., v256 p4536-9 May 1963.

Descriptors: (*Ribonucleic acids, Biosynthesis), (*Enzymes, Biosynthesis), Desoxyribonucleic acids, Antibiotics, Sound, Genetics, Escherichia coli, In vitro analysis, France.

Identifiers: Actinomycins.

AD-639 528 **Field 6A**
Not available from CFSTI.
Weizmann Inst. of Science, Rehovoth (Israel). Section of Chemical Immunology.
PREPARATION AND CHARACTERIZATION OF POLY-DLALANYL RABBIT GAMMA-GLOBULIN.
by Sara Fuchs, and Michael Sela. 23 Mar 65, 12p
Grant AF-EOAR-22-64
Proj. AF-9777
Task 977701
AFOSR-66-1140
Availability: Published in Journal of Biological Chemistry v240 n9 p3558-67 Sep 1965.

Descriptors: (*Gamma globulin, Molecular properties), Rabbits, Preparation, Amino acids, Solubility, pH, Antigens + antibodies, Chemical analysis, Purification, Electrophoresis, Immune serums, Immunology.

Identifiers: Mercaptoethanol, Alanines.

Poly-DL-Alanyl rabbit gamma-globulin was prepared from gamma-globulin and N-carboxy-DL-alanine anhydride, and purified by chromatograph on columns of Sephadex G-50. Over 75% of the epsilon-amino groups reacted with the monomer, yielding derivatives in which around 700 alanine residues are attached, on the average, per globulin molecule. Polyalanyl globulin preparations were cleaved with mercaptoethanol in the absence of urea, and could be fragmented with papain to yield analylated chains and fragments. These were separated and analyzed for their alanine content. The extent of attachment of alanine residues per epsilon-amino group of chain A or B was essentially the same. Alanylated globulins, chains, and fragments were characterized physico-chemically and compared with their unalanylated analogues. Solubility is increased upon poly-DL-alanylation; polyalanyl analogues. Solubility is increased upon poly-DL-alanylation; polyalanyl globulin is not precipitated by 37% saturated aqueous ammonium sulfate; and the alanylated A Chain is completely soluble at all pH values, unlike the A chain obtained upon partial reduction of unmodified gamma-globulin. Alanylated antibody molecules kept their capacity to bind the antigen, but lost their ability to precipitate the antigen. Thus polyalanylation of rabbit immune gamma-globulin increased its solubility significantly without drastically affecting its antigenic or antibody properties. (Author)

AD-639 529 **Field 6A**
Not available from CFSTI.
Oxford Univ. (England). Dept. of Pharmacology.
ACID NUCLEASES OF THE BOVINE ADRENAL MEDULLA.
by A. D. Smith, and H. Winkler. 1965, 4p
Grant AF-EOAR-12-64
Proj. AF-9777
Task 977701
AFOSR-66-0849
Availability: Published in Nature v207 n4997 p634 Aug 7 1965.

Descriptors: (*Ribonuclease, *Cytology), Enzymes, Bovines, Adrenal glands, Granules, Great Britain.

Identifiers: Deoxyribonuclease.

The observations show that the RNase described by Phillippu and Schumann is present in the soluble protein fraction and also that an acid DNase is present in the same lysate. The material used in this study was obtained from the bovine adrenal medullary 'large granule' fraction by ultracentrifugation over a sucrose density gradient. Although a possible contamination of the chromaffin granules by either mitochondria or microsomes can be excluded as a source of the enzymatic activities studied, the possiblity remains that the two enzymes are lysosomal in origin. Two alternative interpretations offer themselves: either the presence of the two acid hydrolases is an expression of a close relationship between chromaffin granules and lysosomes, or the two enzymes are located not in the chromaffin granules but in lysosomes which might be present in the particulate fraction isolated from the chromaffin tissue. (Author)

AD-639 530 **Field 6A**
Not available from CFSTI.
Oxford Univ. (England). Dept. of Pharmacology.
PYRIDOXAL PHOSPHATE AS A CONSTITUENT OF THE HISTAMINASE (BENZYLAMINE OXIDASE) OF PIG PLASMA.
Revised ed.
by H. Blaschko, and Franca Buffoni. 1 Apr 65, 18p
Grant AF-EOAR-12-64
Proj. AF-9777
Task 977701
AFOSR-66-1143
Revision of manuscript submitted 2 Feb 1965. See also AD-620 596.
Availability: Published in Proceedings of the Royal Society v163 p45-60 1965.

Descriptors: (*Diamine oxidase, Chemical analysis), (*Blood plasma, Diamine oxidase), Swine, Oxidoreductases, Phosphates, Enzyme inhibitors, Tryptophan, Copper, Chromatographic analysis, Electrophoresis, Vitamin B complex, Amino acids, Great Britain.

Identifiers: Histaminases, Pyridoxal phosphate.

The histaminase ('benzylamine oxidase') of pig plasma has recently been crystallized and a description is given of some of the physical and chemical properties of the pure preparation of the oxidase. The fluorescence of the enzyme is typical of a protein containing tryptophan. The phosphorus content is about four atoms per molecule. On enzymic hydrolysis a product has been obtained that has the fluorescence properties of a pyridoxal protein. This product gave rise on acid hydrolysis to material capable of activating the L-typrosine apodecarboxylase of Streptococcus faecalis R in the presence of adenosine triphosphate, indicating that pyridoxal was set free in the hydrolysis. Acid hydrolysis of a solution of the crystalline enzyme and subsequent treatment with urea yielded diffusible material with the spectroscopic and fluorescence properties of pyridoxal. Using the bacterial apodecarboxylase, traces of pyridoxal phosphate and larger amounts of free pyridoxal were shown to be present. It was calculated that about 3 or 4 moles of pridoxal were present per mole of enzyme. Together with the phosphate estimations, these phosphate per mole. Observations on rate maintained on a diet deficient in vitamin B6 are in agreement with these conclusions. (Author)

AD-639 620 **Field 6A**
Not available from CFSTI.
University Coll., Galway (Eire). Dept. of Biochemistry.
R-PHYCOCYANIN, A DISTINCT TYPE OF BILIPROTEIN.
by Padraig O. Carra, and Colm O. hEocha. 3 Nov 64, 7p
Grants AF-EOAR-62-38, AF-EOAR-18-63
Proj. AF-9777
Task 977701
AFOSR-66-0848
Availability: Published in Phytochemistry v4 p635-8 1965.

Descriptors: (*Chromoproteins, Biochemistry), (*Organic pigments, Biochemistry), Physical properties, Eire.

Identifiers: Biliproteins, Phycocyanins.

It was shown by fractionation and analytical methods, spectrophotometric and denaturation studies, and microscopic examination of crystalline samples, that R-phycocyanin is a distinct type of biliprotein, contrary to the suggestion of Hattori and Fujita (J. Biochem. (Tokyo) 46, 903 (1959)) who claimed that it is impure C-phycocyanin. (Author)

AD-639 621 **Field 6A**
Not available from CFSTI.
University Coll., Galway (Eire). Dept. of Biochemistry.
PHYCOBILINS.
by Colm O. hEocha. 1963, 24p
Grant AF-EOAR-18-63
Proj. AF-9777
Task 977701
AFOSR-66-1106
Availability: Published in Chemistry and Biochemistry of Plant Pigments p175-96 1965.

Descriptors: (*Organic pigments, Biochemistry), (*Bile pigments, Biochemistry), (*Chromoproteins, Biochemistry), Algae, Eire.

Identifiers: Biliproteins.

Contents: Occurrence; Structure and Properties of the Bile Pigments; The Phycobilins (Preparation and Properties); The Algal Biliproteins (Protein Structure and Spectral Properties of Denatured-Biliproteins); Biosynthesis.

N66-24842 **Field 6**
CFSTI Prices HC$2.00 MF$0.50
Miami Univ., Coral Gables, Fla.
THE TERRESTRIAL ORIGINS OF MACRO MOLECULES AND OF CELLS.
by S. W. Fox. 1965, 41p NASA-CR-74819
Grants NSG-173-62, NSG-689
Presented At The Colloq. On Elementary Bio Systems And Abiogenesis, Paris, 23-25 Nov. 196 Its Contrib. No. 056

Descriptors: *Abiogenesis, Acid, Amin Analysis, *Biogenesis, Biology, Catalys Cell, Cytology, Development, Evolution, Fi sion, Molecular, Organism, Polymer, Prote noid, *Protobiology, Synthesis.

For abstract, see S 04 13.

N66-26235 **Field 6**
CFSTI Prices HC$2.00 MF$0.50
San Francisco Univ., Calif.
BRAIN AMINO ACIDS AND BIOGENIC AMINE UNDER VARIOUS ATMOSPHERIC MIXTURE SEMIANNUAL REPORT, 1 MAR. 1965 - 30 APR 1966.
by H. B. Chermside III, J. H. Gast, and M. A. Kelly. 9 May 66, 37p NASA-CR-75080
Contract NGR-05-029-001

Descriptors: Acid, *Amine, Amino, *Amin acid, Analysis, Animal, *Animal study, A mospheric, *Atmospheric composition, B ogeny, *Brain, Data, Experiment, Free, Ga *Gas mixture, Gaseous, Instrumentatio Mixture, Rat, Study.

For abstract, see S 04 14.

N66-26260 **Field 6**
CFSTI Prices HC$2.00 MF$0.50
Kansas State Univ., Manhattan.
GAS CHROMATOGRAPHY TECHNIQUES FO THE DETERMINATION OF DILUTE CONST TUENTS OF BIOLOGICAL MATERIAL, IN CLUDING CONSIDERATION OF MATERIA RELEVANT TO THE ECOLOGY OF ASTRO NAUTS STATUS REPORT, OCT. 6, 1965 - APR 6, 1966.
by W. S. Ruliffson. 1966, 27p NASA-CR-74972
Grant NSG-292

Descriptors: Analysis, Biological, Chemica *Chemical analysis, Chromatography, Const tuency, Gas, Liver, Mass, *Mass spectrome er, Material, *Mitochondria, Organic, *Orga ic material, Rat, Spectrometer, Suspensio Technique, *Tissue.

For abstract, see S 04 14.

N66-35167 **Field 6**
CFSTI Prices HC$1.00 MF$0.50
Florida State Univ., Tallahassee.
COPOLYMERIZATION OF THE LEUCI ANHYDRIDES OF THE EIGHTEEN AMIN ACIDS COMMON TO PROTEIN.
by S. W. Fox, T. Hayakawa, and C. R. Windsor. 1966, 23p NASA-CR-77448
Grant NSG-173-62
Submitted For Publication

Descriptors: Acid, Amino, *Amino aci *Anhydride, *Biochemistry, Chromatogra Composition, *Copolymer, Nutrition, Polym erization, *Protein, Synthesis, Value.

For abstract, see S 04 20.

N66-35176 **Field 6**
CFSTI Prices HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
MASS SPECTROMETRIC STUDIES OF PE TIDES. III. AUTOMATED DETERMINATIO OF AMINO ACID SEQUENCES.

by F. W. Mc lafferty, M. Senn, and R. Venkataraghavan. 1966. 21p NASA-CR-77446
Contracts NGR-15-005-021, NIH GM-12755
Submitted For Publication

Descriptors: Acid, Amino, *Amino acid, Analysis, Automatic, Calculation, Derivative, Determination, Ester, Mass, *Mass spectrometry, *Peptide, Protein, Sequence, Spectrometry.

For abstract, see S 04 20.

AD-290 195 **See Field 6S**

AD-639 138 **See Field 7C**

N66-24714 **See Field 6P**

6B. BIOENGINEERING

N66-24548 **Field 6B**
CFSTI Prices HC$3.00 MF$0.75
Lockheed Missiles And Space Co., Sunnyvale, Calif.
STATE-OF-THE-ART BIOLOGICAL DATA HANDBOOK FINAL REPORT.
by M. A. Mc lennan. Aug 65, 86p NASA-CR-74645, LMSC-4-05-65-4
Contract NAS2-2479

Descriptors: Amplifier, *Bioinstrumentation, Biological, Biosensor, Conditioning, Data, Electronic, Equipment, Handbook, Onboard, *Physiological telemetry, Physiology, Processing, Sensor, Signal, *Signal processing, Spacecraft, *Spacecraft electronic equipment, Telemetry, Test, *Transducer.

For abstract, see S 04 13.

N66-24968 **Field 6B**
CFSTI Prices HC$2.00 MF$0.50
Carnegie Inst. Of Tech., Pittsburgh, Pa.
DEVELOPMENT OF NEW MICROSPECTROPHOTOMETRIC INSTRUMENTATION ANNUAL REPORT, OCT. 1, 1965 - APR. 30, 1966.
by J. J. Wolken. 1966, 28p NASA-CR-74679
Contract NGR-39-002-011

Descriptors: Biochemistry, Biological, *Biological cell, Biology, Biophysics, Cell, Energetic, Engineering, Molecule, Organic, Pigment, Spectrophotometer, *Spectroscopy.

For abstract, see S 04 13.

N66-24991 **Field 6B**
CFSTI Prices HC$2.00 MF$0.50
California Univ., Los Angeles.
ANALYSIS OF BASELINE AND GEMINI FLIGHT GT-7 EEG DATA WITH SPECIFICATION OF ON-LINE COMPUTING REQUIREMENTS.
by W. R. Adey, R. T. Kado, and D. O. Walter. 1965, 39p NASA-CR-74716
Grant NSG-505

Descriptors: Aerospace, Astronaut, Brain, Computer, *Computer method, Consciousness, Detection, Digital, Discrimination, Display, *Electroencephalogram (eeg), *Gemini project, Human, Medicine, Method, *Neurophysiology, Pattern, *Pattern recognition, Recognition, Sleep, Wave.

For abstract, see S 04 13.

N66-25548 **Field 6B**
CFSTI Prices HC$2.00 MF$0.50
Spacelabs, Inc., Van Nuys, Calif.
DRY ELECTRODES FOR PHYSIOLOGICAL MONITORING.
by C. W. Patten, F. B. Ramme, and J. A. Roman. May 66, 40p NASA-TN-D-3414
Contracts NAS4-390, NAS4-791

Descriptors: Application, *Bioinstrumentation, *Electrocardiography, *Electrode, *Electroencephalography, Equipment, Human, Method, *Monitor, *Physiology, Preparation, Spray.

For abstract, see S 04 14.

N66-25560 **Field 6B**
CFSTI Prices HC$5.00 MF$0.75
Spacelabs, Inc., Van Nuys, Calif.
X-15 DATA DISPLAY SYSTEM.
May 66, 83p NASA-CR-460
Contract NAS4-589

Descriptors: Aircraft, Data, *Data processing, Digital, *Digital technique, Display, *Display system, Electrocardiogram, Noise, *Physiological response, Physiology, Pilot, Processing, Respiration, Response, Signal, System, Technique, Waveform, *X-15 aircraft.

For abstract, see S 04 14.

N66-25565 **Field 6B**
CFSTI Prices HC$3.00 MF$0.75
Cbs Labs., Stamford, Conn.
DEVELOPMENT OF AN ELECTRONIC DUMMY FOR ACOUSTICAL TESTING (INCORPORATING MANUAL OF OPERATION AND DESIGN) FINAL REPORT, JUN. 1965 - FEB. 1966.
28 Mar 66, 93p NASA-CR-65348, CLD-1760
Contract NAS9-4414

Descriptors: Artificial, *Artificial ear, Body, *Dummy, Ear, Electronics, Equipment, Helmet, Human, *Human body, Instruction, *Manual, *Simulation, Space, Speech, Voice.

For abstract, see S 04 14.

N66-26860 **Field 6B**
CFSTI Prices HC$3.00 MF$0.75
North American Aviation, Inc., El Segundo, Calif.
VIBROCARDIOGRAPHIC SYSTEM STUDY FINAL TECHNICAL REPORT, 24 JUL. 1964 - 15 JAN. 1965.
by P. R. Barker, J. T. Celentano, and L. N. Wright. Jun 66, 78p NASA-CR-504
Contract NAS4-930
Prepared For Lear Siegler, Inc., Santa Monica, Calif.

Descriptors: Animal, *Animal study, Blood, *Blood pressure, Cardiology, *Dog, *Electrocardiography, Heart, Pressure, Sensor, Study, Surgery, Ventricle, *Vibrocardiogram.

For abstract, see S 04 14.

N66-34311 **Field 6B**
CFSTI Prices HC$2.50 MF$0.75
Goodyear Aerospace Corp., Litchfield Park, Ariz.
THE DYNAMICS OF THE SEMICIRCULAR CANALS.
by F. Belanger, and R. Mayne. 22 Nov 65, 59p NASA-CR-65455, GERA-1085
Contract NAS9-4460

Descriptors: Acceleration, Canal, Differential, *Differential equation, Displacement, Dynamic, *Dynamic response, Equation, Function, Input, Motion, Pulse, Response, Semicircular, *Semicircular canal, Sinusoid, State, Steady, Theoretical, Transfer, *Transfer function, Velocity.

For abstract, see S 04 20.

N66-34608 **Field 6B**
CFSTI Prices HC$3.00 MF$0.75
Melpar, Inc., Falls Church, Va.
HUMAN PERFORMANCE CONTROL MONITORING SYSTEM FINAL REPORT, JAN. 1965 - FEB. 1966.
by R. E. Mirabelli. Mar 66, 87p NASA-CR-77272
Contract NASW-1085

Descriptors: Application, Computer, *Computer simulation, Control, Decision, Human, *Human performance, Life, Logic, *Mathematical model, Mathematics, Model, Monitor, Network, Performance, Simulation, Support, System.

For abstract, see S 04 20.

PB-172 423 **Field 6B, 6E**
CFSTI Prices: HC$4.00 MF$0.75
Hydrospace Research Corp., Rockville, Md.
MOCK CIRCULATORY SYSTEM.
Progress rept., 26 Sep 65-29 Apr 66, 29 Apr 66, 116p
Contract NIH-PH-43-64-78

Descriptors: (*Artificial organs, Test equipment), (*Cardiovascular system, Models (Simulations)), Systems engineering, Blood vessels, Heart, Control systems, Power sources, Fluid dynamic properties, Diseases, Simulation, Valves, Gas pumps, Compressors.

Identifiers: Artificial heart.

A study was conducted to determine the requirements of a Mock Circulatory System which will have the capability of realistically testing an implantable artificial heart along with its control mechanisms, power sources, and other auxiliary devices. Tests were conducted on the Mock Circulatory System to determine the capabilities and limitations of the present system, defining the characteristics of the system and indicating where improvements in components would be helpful in simulating the human circulatory system. Tests of the dynamic response of the system were also conducted in order to determine response times and reactions to normal demands for increased cardiac output such as occur with increased exercise. Reaction of the system to various pathological conditions was considered. New techniques of fabrication were explored which will allow the manufacture of more realistic designs of Mock Circulatory Systems.

AD-638 792 **See Field 6S**

6C. BIOLOGY

AD-638 808 **Field 6C**
CFSTI Prices: HC$4.00 MF$0.75
Philippines Univ., Manila. Inst. of Hygiene.
STUDIES ON FILARIASIS IN THE REPUBLIC OF THE PHILIPPINES.
Final rept. no. 2, Jul 65-Jul 66.
by Benjamin D. Cabrera. Aug 66, 112p
Contract DA-92-557-FEC-38366
Proj. DA-3A014501A71Q
Tasks 02, 037FE
ARDG (FE)-J-253-2

Descriptors: (*Filariae, *Philippines), Diseases, Distribution, Rainfall, Disease vectors, Diagnosis, Chemotherapy, Culicidae, Public health, Statistical data.

Identifiers: Diethylcarbamazine.

Blood surveys in the Province of Palawan resulted in prevalence rates of 4.7, 4.2 and 0.8 per cent for W. bancrofti, B. malayi and mixed infection respectively. Malayan filariasis and a very restricted distribution compared to bancroftian filariasis. Males had higher microfilaremia rates than females for both species. Children had higher microfilaremia rates in malayan and lower in bancroftian filariasis. Average microfilarial density was higher in bancroftian than malayan and males had higher microfilarial density than females in the two species. Similar survey in Jolo resulted in a prevalence rate of 11.4 per cent. Atypical microfilariae found together with typical ones, when examined in detail revealed that they were also of W. ban-

crofti. Microfilaremia rates in makes were higher than in females and rates were higher among older age groups. In Jolo there were more children with microfilaremia compared to Palawan. Extent of abaca plantation and magnitude of filariasis in all municipalities of Jolo showed no correlation, but 'poblacions' located near abaca plantations had higher prevalence rates. Aedes (Finlaya) poecilus, is the vector of filariasis in Jolo island which confirmed previous finding in Sorsogon, another abaca raising province. Malayan filariasis cases treated with diethylcarbamazine were observed for side reactions. Fever, joint pains, chilliness and headache were the most common reactions and were directly related to microfilarial density. Culex fatigans and Aedes albopictus were not susceptible to experimental infection with B. malayi whereas Mansonia bonneae showed high infection rates. (Author)

AD-638 895 **Field 6C**
Not available from CFSTI.
Cambridge Univ. (England). Dept. of Zoology.
SELECTION OF NEST MATERIAL BY FEMALE CANARIES.
by R. A. Hinde, and E. A. Steel. 31 Mar 61, 9p
Grant AF-EOAR-62-44
AFOSR-4200
Availability: Published in Animal Behaviour v10 n1-2 p67-75 Jan-Apr 1962.

Descriptors: (*Birds, Behavior), Reproduction (Physiology), Females, Estrogens, Progesterone, Feathers, Materials, Selection, Hormones, Secretion, Great Britain.

Conclusions: Birds which are not actively building show no clear preference between grass and feathers. Females treated with oestrogen, building in large pans and provided with nest material only during occasional watches select mostly grass. The preference for grass is correlated with active building under circumstances in which stimulation of the ventral surfaces is infrequent and/or of low intensity. It does not appear to be related to any change in peripheral stimulation, and so may be a consequence of central hormonal action. The addition of progesterone or prolactin to the oestrogen does not affect the preference for grass under these conditions. In normal building the female brings a higher proportion of feathers to the nest as the date of egg laying approaches. This is partly due to the decreasing size of the nest cup, for females bring a higher proportion of feathers when building in a small nest cup than when building in a large one. However, females provided with a small nest cup but not allowed to build a nest in it show an increasing preference for feathers as egg laying approaches even though the size of the nest cup remains constant. (Author)

AD-638 929 **Field 6C**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
GREENHOUSE TESTS TO COMPARE EUROPEAN AND BELTSVILLE ISOLATES OF PERONOSPORA TABACINA.
by Paul J. Wuest, and C. G. Schmitt. 1965, 4p
Availability: Published in Plant Disease Reporter v49 n5 p367-70 May 15 1965.

Descriptors: (*Tobacco, Diseases), Plants (Botany), Spores, Germination, Inhibition, Fungi, Temperature.

Of the tobaccos used to differentiate a European and the Beltsville isolate of Peronospora tabacina, sporulation occurred on Nicotiana goodspeedii with the European but not with the Beltsville isolate. This situation was reversed on Bel 62-502-1 (N. tabacum selection). Water-soluble germination inhibitors are present in both fungus isolates. Germination of the two isolates in response to temperature is similar. The European may sporulate more profusely on a susceptible host than does the Beltsville isolate; it also has a narrower temperature range for sporulation. (Author)

AD-638 932 **Field 6C**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
AMINO ACID COMPOSITION OF UREDOSPORES OF PUCCINA GRAMINIS TRITICI.
by David Stefanye, and Kenneth R. Bromfield.
1 Feb 65, 5p
Availability: Published in Canadian Journal of Botany v43 p695-9 1965.

Descriptors: (*Puccinia (Rusts), Amino acids), Spores, Quantitative analysis, Chromatographic analysis, Plants (Botany), Wheat.

Uredospores of Puccinia graminis var. tritici (race 56) were analyzed quantitatively for total free amino acids and ninhydrin-positive substances by ion-exchange chromatography. Extracts of these substances were obtained by leaching the spores and by re-extracting leached spores with boiling water. Thirty-five ninhydrin-positive compounds were found and identified. The leach extract differed quantitatively from the extract obtained by boiling although both contained the same 35 substances. It is proposed that there are easily extractable ninhydrin-positive substances coating the spore wall and ninhydrin-positive substances in the protoplasm that can be extracted only with difficulty. (Author)

AD-638 940 **Field 6C, 6E**
Not available from CFSTI.
Toronto Univ. (Ontario). Dept. of Medical Biophysics.
THE CELLULAR BASIS FOR THE DEFECT IN HAEMOPOIESIS IN FLEXED-TAILED MICE. I. THE NATURE AND PERSISTENCE OF THE DEFECT.
by M. W. Thompson, E. A. McCulloch, L. Siminovitch, and J. E. Till. 1965, 10p
Grants DRB-9350-14, MA-1420
Supported in part by grant MA-1625
Availability: Published in British Journal of Haematology v12 n2 p152-60 Mar 1966.

Descriptors: (*Hemopoietic system, *Genetics), (*Anemias, Mice), Mutations, Hematology, Blood cells, Spleen, Liver, Bone marrow, Transplantation, Iron, Hemoglobin, Labeled substances, Tracer studies, In vitro analysis.

The cellular basis for the severe transitory siderocytic anaemia of flexed-tailed mice (f/f) was studied using the spleen-colony method. Spleen colonies formed by cells from embryonic liver, 8-week adult marrow and 7-month adult marrow of f/f origin were found to be small in size and to possess a decreased ability to incorporate radio-iron into haem. When marrow cells of f/f origin were transplanted into irradiated hosts, cells derived from the spleens of the recipient animals showed a low capacity to incorporate 59Fe into haem from the 6th to the 10th day after transplantation, when compared with cells derived from normal f/f controls. After the 10th day, the difference in iron-incorporating ability between cells of normal and f/f origin decreased, with no difference being apparent after 30 days. These results indicate that haemopoietic colony-forming cells from the tissue of non-anaemic adult animals are like those from anaemic foetal animals, in that cells from both sources bear a defect which is manifested as soon as the cells undertake rapid proliferation. These findings are discussed in relation to the transient nature of the anaemia in f/f mice. (Author)

AD-638 949 **Field 6C**
Not available from CFSTI.
California Univ., Santa Barbara. Dept. of Biological Sciences.
RELATIONSHIP BETWEEN CONDITIONING AND COMMUNICATION IN HONEY BEES.
Revised ed.
by Dennis L. Johnson, and Adrian M. Wenner.
2 Feb 66, 5p
Proj. NR-301-800
Revision of manuscript submitted 3 Nov 65.
Availability: Published in Animal Behaviour v14 n2-3 p261-5 Apr/Jul 1966.

Descriptors: (*Hymenoptera, Behavior), Conditioned reflex, Communication systems, Learning.

The experiments indicate that the honey bee waggle dance has perhaps been over-rated as a mechanism by which a colony routinely exploits intermittent food sources. Early build-up at a previously visited site by experienced foragers immediately after fresh provisioning at this site closely resembles the exponential increase one would expect from recruitment by dance communication. The success in sending experienced foragers into the field merely by blowing odour of the food source into the hive, however, indicates that simple discrimination conditioning (Wenner and Johnson, 1966) appears to be sufficient for effective communication between a successful returning forager and an experienced forager in the hive, a conclusion earlier stated by Ribbands (1954). The experiments also indicate that, although the dance may contain information concerning location of food sources, there is no clear evidence on the ability of bees to use this information. The waggle dance, therefore, may play the rather restrictive role of insuring a slow turnover of foragers at a continually producing crop; or of providing a possibility for an increase in foragers at a newly discovered source of food; or, possibly, of exploiting a dependable but distant source.

AD-638 950 **Field 6C**
Not available from CFSTI.
California Univ., Santa Barbara.
A RELATIONSHIP BETWEEN CONDITIONING AND COMMUNICATION IN HONEY BEES.
by Dennis L. Johnson, and Adrian M. Wenner.
1965, 1p
Proj. NR-301-800
Availability: Published in American Zoologist v5 n4 p123 Nov 1965.

Descriptors: (*Hymenoptera, Behavior), Conditioned reflex, Learning, Communication systems, Odors.

Bees from an observation hive were trained to forage clove-scented sucrose solution in a feeding dish 150 m. from the hive. When no sugar was present, the individually marked foragers periodically investigated the dish. When sugar solution was provided at the dish the number of visiting bees increased exponentially over at least a 15 minute period. Bees which filled the dish returned to the hive and remained there 2-3 min., occasionally exchanging solution with other bees; but only rarely did bees dance during this time. It appears that communication of presence of food at a known source location occurs by means other than the bee dance. It was felt that clove scent adhering to the body of the first forager which visited the sugar filled dish may have served as a cue for those bees which had been previously trained to the feeding dish's location. Thus, as more conditioned bees came into contact with a clove-scented forager, progressively more trained bees would be stimulated to visit the dish. To test this notion, a person tallied bees visiting the empty dish for 15 min. intervals before, during, and after another person injected clove aroma directly into the hive. Numbers of bees seen at the dish were as follows: 8 different bees arrived with one returning, 20 with 7 returning, and 6 with no returning, respectively. Two subsequent repeats of this experiment yielded similar results. It appears that a group of bees which learns the position of a food source may associate a cue (i.e. odor) with this source which later permits communication in this conditioned group of foragers without a necessity for dancing. (Author)

AD-639 075 **Field 6C**
Not available from CFSTI.
Harvard Univ., Boston, Mass. Medical School.
SCHISTOSOMIASIS MANSONI IN THE CHIMPANZEE: PARASITOLOGIC, CLINICAL, SEROLOGIC, PATHOLOGIC AND RADIOLOGIC OBSERVATIONS.

by E. H. Sadun, F. Von Lichtenberg, R. L. Hickman, J. I. Bruce, and J. H. Smith. 1966, 11p
Contract DA-49-193-MD-2253
Prepared in cooperation with Walter Reed Army Inst. of Research, Washington, D. C., Dept. of Medical Zoology.
Availability: Published in American Journal of Tropical Medicine and Hygiene v15 n4 p496-506 (1966).

Descriptors: (*Schistosoma, *Chimpanzees), Parasitic diseases, Serodiagnosis, Pathology, Radiobiology, Diseases, Biopsy, Antigens + antibodies, Histology, Hematology.

Studies conducted in splenectomized and intact chimpanzees (Pan satyrus) indicated that this primate is susceptible to experimental infections with Schistosoma mansoni. After a prepatent period of six to seven weeks, viable eggs appeared in the stools. The pattern of egg production remained relatively constant and sustained for the duration of the experiment. At necropsy, active and well-developed adult schistosomes were found in the distal branches of the mesenteries. Although most of the eggs were recovered in the large intestine and in the liver, viable eggs were also found in the lungs, the pancreas, the kidneys, the small intestine, the urinary bladder and the spleen. In the heavily infected chimpanzees, there was an elevation in temperature between the sixth and ninth week after exposure, anoxia, diarrhea with mucus and frank hemorrhage, and a transient marked decrease in activity and responsiveness. These symptoms were followed approximately three weeks later by transient hepatomegaly and ascites. A lymphocytic leukocytosis accompanied the first appearance of eggs in the feces and the onset of clinical symptoms. Pathologic and radiologic observations revealed changes resembling human pipestem fibrosis in a heavily infected animals,, and portocaval anastomoses around the lower esophagus and diaphragm. Most of the eggs in the gut were in the mucosal layer. (Author)

AD-639 272 **Field 6C, 20H**
Not available from CFSTI.
Linde Div., Union Carbide Corp., Tonawanda, N. Y.
MECHANISMS OF THE BIOLOGICAL EFFECTS OF NOBLE GASES: NEUTRON INELASTIC SCATTERING STUDY OF XENON - WATER INTERACTIONS.
by G. J. Safford, H. R. Schreiner, and G. F. Doebbler. 1966, 1p
Contract AF 49 (638)-1611
AFOSR-66-1119
Availability: Published in Biophysical Society, Annual Meeting (10th), February 23-25, 1966, Statler Hilton Hotel, Boston, Mass.

Descriptors: (*Helium group gases, Biophysics), (*Xenon, Inelastic scattering), Chemical bonds, Neutron scattering, Water, Molecular structure.

The noble gases produce biological effects ranging from narcosis of intact animals to inhibition of certain enzymes. The possible involvement of water - noble gas interactions in producing these effects has been examined by measurement of neutron inelastic scattering spectra of water and water - xenon systems at various temperatures and pressures. Low energy neutrons are scattered inelastically by a specimen and the distribution of energies gained is measured. Intermolecular interactions involving hindered translations and rotations of water molecules and frequencies of 900/cm to 8/cm are observed. These are sensitive to bonding and to symmetry of the environment of the water molecules. Spectra of xenon-water show the presence of new structure involving hydrogen bonded water molecules at temperatures and pressures at which xenon hydrate is not expected to be stable but at which biological effects occur. This structure, different from that of pure water, becomes more pronounced as temperature and pressure conditions approach those at which xenon-hydrate is stable. (Author)

AD-639 326 **Field 6C**
Not available from CFSTI.
Centre National de la Recherche Scientifique, Paris (France).
MESURES SPECTROPHOTOMETRIQUES DE LA SATURATION EN OXYGENE DE L'HEMOPROTEINE D'APLYSIA DEPILANS (Spectrophotometric Measures of the Oxygen Saturation of the Hemoprotein of Aplysia Depilans).
by M. Gola, and N. Chalazonitis. 1965, 8p
Grants AF-EOAR-114-63, PHS-NB-03337
Proj. AF-9777
Task 977701
AFOSR-66-0744
Text in French.
Availability: Published in Comptes Rendus des Seances de la Societe de Biologie v159 n8/9 p1777-82 1965.

Descriptors: (*Hemoglobin, Gastropoda), Nerve cells, Ganglia, Organic pigments, Oxygen, Nervous system, Physiology, Spectroscopy, France.

Identifiers: Aplysia.

AD-639 329 **Field 6C**
Not available from CFSTI.
Centre National de la Recherche Scientifique, Paris (France).
ENREGISTREMENTS SIMULTANEOUS DE LA PO2 INTRACELLULAIRE ET DE L'AUTOACTIVITE ELECTRIQUE DU NEURONE GEANT (APLYSIA DEPILANS) (Simultaneous Recording of Intracellular pO2 and Spontaneous Electrical Activity in the Giant Neuron of Aplysia Depilans).
by N. Chalazonitis, and M. Gola. 1965, 11p
Grants AF-EOAR-114-63, PHS-NB-03337
Proj. 9777
Task 977701
AFOSR-66-0746
Text in French.
Availability: Published in Comptes Rendus des Seances de la Societe de Biologie, v159 n8/9 p1770-8 1965.

Descriptors: (*Nerve cells, Oxygen), (*Nervous system, *Gastropoda), Electrophysiology, Membranes (Biology), Physiology, France.

Identifiers: Aplysia.

Intracellular variations in pO2 of less than 5 mm Hg are sufficient to cause significant changes in membrane potential and frequency of discharge, suggesting that under physiological conditions small fluctuations in pO2 in the central nerves can act as a regulating influence on certain neurons. (Author)

AD-639 401 **Field 6C, 2D**
CFSTI Prices: HC$1.00 MF$0.50
Army Biological Labs., Frederick, Md.
NEW METHODS FOR INVESTIGATING THE POTATO NEMATODE.
by V. I. Belokurskaya. 1963, 5p Trans-1071
TT-66-62325
Trans. of Zashchita Rastenii ot Vreditelei i Bolezner (USSR), v8 n6 p41-2 1963.

Descriptors: (*Potatoes, *Nematodes), Soils, Test methods, USSR.

AD-639 404 **Field 6C**
CFSTI Prices: HC$1.00 MF$0.50
Army Biological Labs., Frederick, Md.
DISEASES OF COTTON PLANTS IN INDIA.
by E. V. Shver. Jul 65, 7p Trans-1476
TT-66-62328
Trans. of Zashchita Rastenii ot Vreditelei i Bolezner (USSR) n7 p45-8 1964.

Descriptors: (*Cotton, Diseases), Agriculture, Plants (Botany), Fungi, India, USSR.

AD-639 468 **Field 6C**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Zoology.
EFFECT OF CO2 ON THE GROWTH OF A BLEACHED EUGLENA.
by R. D. Tremmel, and B. H. Levedahl. 3 Aug 65, 5p
Contract Nonr-233 (95)
Proj. NR-108-673
Availability: Published in Journal of Cellular Physiology v67 n2 p361-6 Apr 1966.

Descriptors: (*Algae, Growth), (*Protozoa, Growth), Carbon dioxide, Streptomycins, Succinates, Acetates, Bicarbonates, Antimetabolites.

Identifiers: Euglena gracilis.

The addition of CO2 in gaseous form to the growth medium of Euglena gracilis var bacillaris (streptomycin bleached) results in a marked increase in the peak populations reached by the organism. When 20 mM succinate is used as the carbon source, the increase in peak population is proportional to the percentage CO2 enrichment of an air wash up to at least 10% CO2. This extended growth is dependent up the presence of gaseous CO2; bicarbonate ion actually inhibiting growth. Thiamin is not required for the CO2 effect; in fact no thiamin requirement can be demonstrated for this organism under the conditions of this experiment. (Author)

AD-639 511 **Field 6C**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md. School of Medicine.
CONNECTIONS OF OCCIPITAL LOBE IN THE MONKEY.
by Perry Black, and Ronald E. Myers. 1962, 2p
Grant AF-AFOSR-61-38
Proj. AF-9777
Task 977701
AFOSR-66-1118
Availability: Published in Anatomical Record v142 p216-7 1962.

Descriptors: (*Brain, *Monkeys), Excision, Degradation, Anatomy.

The cortical and subcortical patterns of connection were studied after total extirpation of the left occipital lobe in a Macaca mulatta. The removal was limited to areas 17, 18 and 19. In the ipsilateral hemisphere, the Nauta-Gygax technique revealed degeneration in cortex of (a) the inferior temporal gyrus extending into the depths of superior temporal sulcus, (b) the angular gyrus extending into the depths of the posterior portion in the intraparietal sulcus, (c) the arcuate gyrus, (d) lightly over medial surface of superior parietal gyrus bordering the lesion, and (e) in the subiculum of temporal lobe. In the contralateral hemisphere, while degeneration was less pronounced, the pattern resembled that described for the ipsilateral hemisphere. A notable exception occurred in the inferior temporal gyrus where only scattered loci of degeneration were noted. The occipital lobe contralateral to the lesion was entirely free of degeneration apart from that zone corresponding to area 18. Study of subcortical structures revealed degeneration in (a) the entire tail and in dorsolateral portions of the body of caudate, (b) the entire claustrum, (c) small posterior superior portions of putamen, (d) posterior portions of reticular nucleus of thalamus and in zona incerta, (e) in the inferior and lateral pulvinar nuclei, lateral geniculate nucleus, lateral posterior nucleus, and dorsomedial nucleus of thalamus, (f) in superior colliculus and pretectal region, and (g) in rostrolateral portions of pontine nucleus. (Author)

AD-639 515 **Field 6C**
Not available from CFSTI.
University Coll., London (England).
UNIDIRECTIONAL RESPONSE TO ANGULAR ACCELERATION RECORDED FROM THE MIDDLE CRISTAL NERVE IN THE STATOCYST OF OCTOPUS VULGARIS.

by Humberto R. Maturana, and Suzanne Sperling. 1963, 3p
Grant AF-EOAR-62-37
Proj. AF-9777
Task 977701
AFOSR-66-0853
Prepared in cooperation with California Univ., Los Angeles. Dept. of Zoology.
Availability: Published in Nature v197 p815-16 Feb 23 1963.

Descriptors: (*Cephalopoda, Equilibrium), (*Equilibrium, Control), Acceleration tolerance, Semicircular canals, Nerves, Great Britain.

AD-639 523 **Field 6C, 5J**
Not available from CFSTI.
Oxford Univ. (England). Inst. of Experimental Psychology.
THE EFFECT OF HUNGER ON THIRST MOTIVATED BEHAVIOUR IN THE BARBARY DOVE.
by D. J. McFarland. 1 Nov 64, 9p
Grant AF-EOAR-2-64
Proj. AF-9777
Task 977701
AFOSR-66-0841
Availability: Published in Animal Behavior v13 n2-3 p286-92 Apr-Jul 65.

Descriptors: (*Behavior, *Birds), (*Thirst, Behavior), (*Ingestion (Physiology), Motivation), Starvation, Appetite, Great Britain.

A number of workers have reported that dogs (Kleitman, 1927; Gregerson, 1932; Cizek, 1959), rats (Verplanck and Hayes, 1953; Bolles, 1961) and other animals, including man (Wolf, 1958), eat less than normal when thirsty and drink less when hungry. It has been suggested (Verplanck and Hayes, 1953; Grice and Davis, 1957) that inhibition of eating by thirst produces a food deficit which is capable of motivating behaviour learned for food reward. McFarland (1964) found that the extent to which Barbary doves would work for food when thirsty was commensurate with their secondary hunger, as measured by recovery in food intake after water deprivation. The experiments reported in this paper were designed to investigate the corresponding effect of hunger on thirst motivated behaviour. (Author)

AD-639 604 **Field 6C**
CFSTI Price: MF$0.50
National Academy of Sciences-National Research Council, Washington, D. C. Inst. of Lab. Animal Resources.
PROCUREMENT SPECIFICATION (CONTRACT CLAUSE). I. NONCONDITIONED RANDOM-SOURCE DOGS.
1966, 13p
Contract Nonr-2300 (24), Grant PHS-PH43-64-44
Supported in part by Grant RC-1G, and Contract AT (49-1)643, American Cancer Soc. and AEC. See also AD-639 605.
Availability: Hard copy available from Inst. of Lab. Animal Resources, National Academy of Sciences, Washington, D. C.

Descriptors: (*Dogs, Laboratory animals), (*Laboratory animals, Standards), Medical research, Sources, Procurement, Handling, Transportation, Medical examination, Sanitary engineering, Diet, Hygiene, Biological laboratories, Medical laboratories.

The procurement specification, the first of a series, was produced upon approval of the Institute of Laboratory Animal Resources' Advisory Council to provide the biomedical community with uniform standards for the procurement of laboratory animals. The specification for nonconditioned random-source dogs has been developed for use by both program and procurement officials in institutions requiring this type of dog. Limitations are placed on the laboratory use of the nonconditioned random-source dog because its environmental background is largely unknown. If this dog is to be used as received its use is generally limited to those experiments in which the animal is not allowed to recover from anesthesia. A quarantine and conditioning period of from three to six weeks is required after receipt to utilize this type of dog in more involved studies. It is anticipated that adoption of these procurement standards on a nationwide basis will encourage a more orderly system for procuring unclaimed, unwanted dogs and will ultimately provide a healthier animal. The specification is designed to: (1) Protect the owners of pet animals from the inadvertent use of the animals in biomedical research. (2) Protect the health and provide for the comfort of those animals lawfully acquired for biomedical research.

AD-639 605 **Field 6C**
CFSTI Price: MF$0.50
National Academy of Sciences-National Research Council, Washington, D. C. Inst. of Lab. Animal Resources.
PROCUREMENT SPECIFICATION (CONTRACT CLAUSE). II. NONCONDITIONED RANDOM-SOURCE CATS.
1966, 13p
Contract Nonr-2300 (24), Grant PHS-PH43-64-44
Supported in part by Grant RC-1H, Contract AT (49-1)643, American Cancer Soc., and AEC.
Availability: Hard copy available from Inst. of Lab. Animal Resources, National Academy of Sciences, Washington, D. C.

Descriptors: (*Cats, Laboratory animals), (*Laboratory animals, Standards), Medical research, Sources, Procurement, Handling, Transportation, Medical examination, Sanitary engineering, Diet, Hygiene, Biological laboratories, Medical laboratories.

The procurement specification is the second of a series prepared by the Institute of Laboratory Animal Resources' Subcommittee on Laboratory Animal Procurement Standards, and is designed to provide the biomedical community with uniform specifications for procuring laboratory cats. In many repsects the specification for nonconditioned random-source cats is similar to the one previously prepared for the nonconditioned random-source dog; however, additions and changes have been made where it was appropriate to this species or to give clearer definition to the terms used in the first specification. The subcommittee recognizes a problem for research institutions, animal dealers, dog pounds, and owners of pets in positively determining that the animal in question is not a strayed pet. The members feel that the greatest assurance against a possible mistake is a system of positive identification of pets. Several national tattooing programs are currently being used for this purpose, and research groups are cooperating in the effort to return animals so identified. Limitations are placed on the laboratory use of the nonconditioned random-source cat because its environmental background is largely unknown. If this cat is to be used as received, its use is generally limited to those experiments in which the animal is not allowed to recover from anesthesia. A quarantine and conditioning period of from three to six weeks is required after receipt to utilize this type of cat in more involved studies. The obligation of the research facility to maintain minimum standards for humane handling, care, treatment, and transportation of animals is also recognized.

AD-639 606 **Field 6C**
CFSTI Price: MF$0.75
National Academy of Sciences-National Research Council, Washington, D. C. Inst. of Lab. Animal Resources.
LABORATORY ANIMALS. PART II. ANIMALS FOR RESEARCH.
Sixth ed.
Aug 66, 95p Pub-1413
Contracts Nonr-2300 (24), PH43-64-44
Contract AT (49-1)643, Revised edition.
Availability: Printing and Publishing Office, National Academy of Sciences, 2101 Constitution Avenue, Washington, D. C. 20418 $2.00.

Descriptors: (*Laboratory animals, Directories), Medical research, Biological laboratories, Medical laboratories, Laboratory equipment, Sources.

The directory is divided into the following sections: Section I comprises the listings for the common domestic animals (chickens, turkeys, non-inbred mice, inbred mice, hybrid mice, rats, hamsters, guinea pigs, dogs, cats, cattle, goats, sheep, and swine). Species are arranged by strain designation, strain origin, breeding system, and coded name and address of supplier. Section II lists the commercially available animals obtained from nature in phylogenetic order, beginning with the Protozoa and ending with the Chordata. Scientific name, common name, and coded name and address of supplier are given. Section III lists sources of tissues, organs, and fluids of various species used in research. Section IV indicates suppliers and manufacturers of ancillary laboratory equipment, cages, feed, germ-free equipment, and washing machines. Species of animals for which they can be used, and coded name and address of supplier are provided. Section V gives the coded names, addresses, and telephone numbers of suppliers whose animals, equipment, and materials are listed in the directory. Section VI is composed of two indexes-common animal name and scientific name.

N66-24114 **Field 6C**
CFSTI Prices HC$2.00 MF$0.50
Washington State Univ., Pullman.
ULTRASOUND AND PHAKOMETRY MEASUREMENTS OF THE PRIMATE EYE TECHNICAL REPORT, AUG. 1965.
by D. N. Farrer, G. A. Leary, and F. A. Young. Feb 66, 33p NASA-CR-74013, ARL-TR-66-5
Contract NASA ORDER R-25, PHS-NB-05459-01
Lab., Feb. 1966 33 P Refs

Descriptors: Anterior, Axial, Chamber, *Chimpanzee, Cornea, Examination, Eye, *Eye examination, Human, Length, *Lens, Optical, *Photographic measurement, Primate, Transmission, *Ultrasonic testing.

For abstract, see S 04 13.

N66-26587 **Field 6C**
CFSTI Prices HC$1.00 MF$0.50
Colorado State Univ. Research Foundation, Fort Collins.
A STUDY OF PITUITARY, THYROID AND ADRENAL GLAND RELATIONSHIPS IN GROUND SQUIRRELS (CITELLUS RICHARDSONI) AS INFLUENCED BY DIET AND ATMOSPHERIC PRESSURE FINAL REPORT.
by R. R. Lechleitner. 10 Dec 64, 26p AD-609414
Contract NONR-1610/07/

Descriptors: Activity, *Adrenal gland, Atmospheric, Barometer, *Diet, Endocrine, *Endocrine gland, Gain, Gland, Hibernation, Hormone, Pattern, Pituitary, *Pituitary gland, Pressure, Rodent, *Squirrel, *Thyroid, Weight.

For abstract, see S 04 14.

N66-26750 **Field 6C**
CFSTI Prices HC$1.00 MF$0.50
Aerospace Medical Div. Aeromedical Research Lab. (6571st), Holloman Afb, N. Mex.
THE REFRACTIVE CHARACTERISTICS AND INTRAOCULAR TENSIONS OF COLONY CHIMPANZEES TECHNICAL REPORT, AUG. 1965.
by D. N. Farrer, and F. A. Young. Nov 65, 17p
NASA-CR-75169, ARL-TR-65-23
NASA ORDER R-35

Descriptors: Age, Anesthesia, Animal, *Animal study, Chimpanzee, Error, *Eye, *Intraocular pressure, *Monkey, Pressure, *Refraction, Study, Test.

For abstract, see S 04 14.

N66-26828 **Field 6C**
CFSTI Prices HC$2.00 MF$0.50
Dartmouth Coll., Hanover, N. H.
THE EFFECT OF WEIGHTLESSNESS ON THE GROWTH AND ORIENTATION OF ROOTS AND SHOOTS OF MONOCOTYLEDONOUS SEEDLINGS FINAL REPORT, 1 JUL. 1964 - 30 JUN. 1965.
by C. J. Lyon. 30 Jul 65. 46p NASA-CR-75092
Contract NAS2-1558

Descriptors: Biosatellite, Design, Experiment, Gravity, *Growth, Orientation, *Plant (biol), Root, Seed, *Weightlessness, Zero.

For abstract, see S 04 14.

N66-34636 **Field 6C**
CFSTI Prices HC$4.00 MF$0.75
Massachusetts Inst. Of Tech., Cambridge.
A STATISTICAL ANALYSIS OF ELECTROPHYSIOLOGICAL DATA FROM AUDITORY NERVE FIBERS IN CAT TECHNICAL REPORT NO. 451.
by P. R. Gray. 21 Jun 66. 102p NASA-CR-77274
Grant NSG-496, Contract DA-36-039-AMC-03200/E/

Descriptors: Analysis, Auditory, *Auditory perception, *Cat, *Electrophysiology, Fiber, Hearing, Nerve, Perception, Statistical, *Statistical analysis, Stimulus.

For abstract, see S 04 20.

N66-34667 **Field 6C**
CFSTI Prices HC$3.00 MF$0.75
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
CONTINUATION OF STUDIES IN STATISTICAL DECISION THEORY IN LARGE SCALE BIOLOGICAL EXPERIMENTS FINAL REPORT, 1 MAY 1965 - 31 JUL. 1966.
by D. R. Hitchcock, and G. B. Thomas. 31 Jul 66. 65p NASA-CR-77234, SLS-6309R
Contract NASW-871

Descriptors: *Alkane, Atmosphere, Biology, Chromatography, Decision, Detector, Distribution, Entropy, Experiment, Gas, *Gas chromatography, Life, *Life detector, Mars, *Mars atmosphere, Measurement, Negative, Organism, Statistical, *Statistical decision theory, Theory.

For abstract, see S 04 20.

N66-35179 **Field 6C**
CFSTI Prices HC$1.00 MF$0.50
California Univ., Los Angeles.
EXTRACTION AND BIOASSAY OF RENIN FROM KIDNEYS OF SODIUM-DEPLETED AND SODIUM-LOADED RATS.
by A. T. Cockett, M. Kazmin, R. S. Moore, and A. P. Roberts. 1966. 14p NASA-CR-77466
Grant NSG-237-62, Contract PHS HE-09834-01
Presented At The Am. Urological Assoc. Meeting, Chicago, 29 May - 2 Jun. 1966

Descriptors: Animal, Assay, *Biochemistry, Concentration, Depletion, *Diet, *Enzyme, Experiment, Extraction, *Kidney, Load, *Rat, Renal, Sodium, Study, Tissue.

For abstract, see S 04 20.

N66-35216 **Field 6C**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
THE BIOLOGICAL SIGNIFICANCE OF THE SEARCH FOR EXTRATERRESTRIAL LIFE.
by N. H. Horowitz. 15 Aug 66. 15p NASA-CR-77550, JPL-TR-32-1000
Contract NAS7-100
Presented At The Am. Astronautical Soc., Anaeim, Calif., 23 May 1966

Descriptors: *Biochemistry, Biology, Chemistry, Code, Earth, Environment, *Evolution, Exploration, Extraterrestrial, *Extraterrestrial life, *Genetic code, Genetics, Life, Mars, *Mars environment, Origin, Planetary, Silicon, Terrestrial.

For abstract, see S 04 20.

AD-638 981 **See Field 6M**

AD-639 136 **See Field 6A**

PB-170 957 **See Field 8A**

6D. BIONICS

AD-638 845 **Field 6D**
CFSTI Prices: HC$4.60 MF$0.50
System Research, Ltd., Richmond (England).
THE SIMULATION OF LEARNING AND DECISION-MAKING BEHAVIOR.
by Gordon Pask. 1962. 46p
Contract AF 61 (052)-402
Rept. on Aspects of the Theory of Artificial Intelligence. Chapt. 8. Proceedings of the International Symposium of Biosimulation (1st), Locarno (Switzerland), 29 Jun-5 Jul 60.

Descriptors: (*Learning, Simulation), (*Decision making, Simulation), (*Bionics, Theory), Mathematical analysis, Artificial intelligence, Great Britain.

The paper examines the peculiar difficulties of simulating the learning behavior of man, certain animals, and those mechanical artifacts in which forms of organization evolve. The basic difficulty is due to the fact that these physical structures are adequately representable to an imperfect observer only as self-organizing systems in the sense of a definitive paper by Von Foerster, rather than as systems in the rigidly interpreted sense of Ashby. Consideration is given to an underlying mechanism called 'conceptual home-ostasis' which appears to characterize physical assemblies said to 'learn' and, since it is argued that the currently used experimental methods are unsuitable for investigations of learning, alternative methods and some practical applications are illustrated. (Author)

N66-23971 **Field 6D**
CFSTI Prices HC$5.60 MF$0.50
System Development Corp., Santa Monica, Calif.
UPDATING OF THESAUR PROGRAM.
by T. Ruggles, and S. Y. Sedelow. 17 Dec 65. 53p TM-1908/009/00, AD-629368
Contract NONR-4427/00/

Descriptors: Analysis, Computer, *Computer programming, Information, *Information retrieval, Language, *Language programming, Pattern, Programming, Recognition, Retrieval, Theory, Word.

For abstract, see S 04 13.

PB-170 705 **Field 6D, 9B**
CFSTI Prices: HC$3.60 MF$0.50
Northwestern Univ., Evanston, Ill. Technological Inst.
A PROBLEM SOLVER WITH FORMAL DESCRIPTIVE INPUTS.
by David J. Kuck, and Gilbert K. Krulee. 1966. 31p
Grant NSF-G-17951
NSF Scientific Documentation Project.

Descriptors: (*Problem solving, Automatic), (*Artificial intelligence, Problem solving), Computer logic, Programming (Computers).

A description is given of a system that attempts to solve problems which have initially been presented to it in the form of descriptive statements in ordinary English. The total system falls into two major divisions. The first of these, which has been described elsewhere (see PB-167 934), accepts the verbal statements as inputs and produces as output a formal description of the problem. The second subsystem takes this description as its input and proceeds deductively to obtain a solution. The use of formal representations of physical problems is discussed, the functioning of the problem solver is described, and some formalisms used in programming the system are considered.

AD-639 049 **See Field 5H**

AD-639 493 **See Field 9E**

AD-639 532 **See Field 10A**

6E. CLINICAL MEDICINE

AD-638 917 **Field 6E**
CFSTI Prices: HC$2.00 MF$0.50
New York Eye and Ear Infirmary, N. Y.
INVESTIGATION OF THE EFFECTS OF RUBY LASER RADIATION ON OCULAR TISSUE.
by Jerry H. Jacobson, Harold W. Najac, and Blossom Cooper. Jun 66. 34p
Contract DA-36-038-AMC-685 (A)
Proj. DA-D360
FA-R-1815

Descriptors: (*Lasers, Retina), (*Retina, Burns), Eye, Cornea, Ruby, Wounds + injuries, Ophthalmology, Thresholds (Physiology), Rabbits, Mathematical analysis.

A series of laboratory and field experiments on rabbits were conducted by the New York Eye and Ear Infirmary in order to establish tentative safe operational distances and conditions for use of the Frankford Arsenal XM23 Laser Rangefinder. The measured far field corneal threshold dose for rabbits was tentatively determined to be 5 x 10 to the minus 7th power joule/sq. cm. From this a possible human corneal threshold was calculated as 0.00000145 joule/sq. cm. Based on this value, tentative safe operational distances were calculated as being 6460 meters for night (8 mm pupil), 1615 meters for twilight (4 mm pupil), and 914 meters for daylight (3 mm pupil). (Author)

AD-639 066 **Field 6E, 5J**
Not available from CFSTI.
Navy Medical Neuropsychiatric Research Unit, San Diego, Calif.
THE PREDICTION OF DIAGNOSIS AND DISPOSITION IN NAVAL HOSPITALS.
Interim rept.
by Ransom J. Arthur, and E. K. Eric Gunderson. 1965. 9p Rept. no. 65-20
NAVMED-MF022.01.03-9002
Availability: Published in Journal of Clinical Psychology v22 n3 p259-64 Jul 1966.

Descriptors: (*Psychiatry, Diagnosis), (*Naval personnel, Psychiatry), (*Abnormal psychology, Naval personnel), Psychoses, Neuroses, Personality, Behavior, Illusions, Mental disorders, Etiology, Correlation techniques.

Demographic and clinical data, routinely collected in normal clinical practice within two naval hospitals, were related to psychiatric diagnosis and to disposition for a sample of 473 male Navy enlisted personnel. Four diagnostic categories (Psychosis, Psychoneurosis, Character and Behavior Disorder, and Transient Personality Disorder) and three disposition categories (Restoration to Duty, Discharge from the U.S. Navy, and Transfer for Treatment) were treated as dichotomous criteria, and 44 items of information from psychiatrists' narrative summaries were utilized as predictors in correlational and multiple linear regression

studies of relationship. Consistency in the patterns of correlational relationships with diagnosis and disposition was found at the two hospitals, but, in general, neither diagnosis nor disposition was highly predictable at either hospital. Clinical phenomena (hallucinations) were of major importance in diagnoses of Psychosis while demographic variables were more important than clinical data in diagnoses of Psychoneuroses or Character and Behavior Disorder. (Author)

AD-639 087 **Field 6E**
Not available from CFSTI.
Purdue Univ., Lafayette, Ind. Voice Science Lab.
THE PURDUE PITCH METER--A DIRECT-READING FUNDAMENTAL FREQUENCY ANALYZER.
by M. E. Dempsey, G. L. Draegert, R. P. Siskind, and M. D. Steer. 1949. 8p
Contract N6ori-104- (02)
Proj. NR-782-003
SPECDEVCEN-104-2-18
Availability: Published in The Journal of Speech and Hearing Disorders p135-41 Jun 1950.

Descriptors: (*Audiometry, *Frequency analyzers), Sound pitch, Frequency meters, Speech.

The Purdue Pitch Meter is an instrument designed and built to indicate in cycles per second the fundamental frequency of complex speech sounds. This operation is accomplished by equalizer circuits designed to amplify the lowest frequency component present and attenuate the higher harmonics. Cycles of the amplified fundamental component are counted and indicated on a meter calibrated in cycles per second. The applied signal may be from either a microphone or phonograph. Indicated fundamental frequency in cycles per second may be read directly from the built-in meter or recorded on a suitable recording milliammeter. Fundamental frequency may also be demonstrated as an audible tone without intelligibility. (Author)

AD-639 119 **Field 6E, 6F, 6M**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
EFFECTS OF PROLONGED ANTARCTIC ISOLATION ON ORAL AND INTESTINAL BACTERIA.
by Robert J. Adams, and William R. Stanmeyer. 1960. 4p Rept. no. 335
Prepared in cooperation with Tennessee Univ., Memphis, Coll. of Dentistry.
Availability: Published in Oral Surgery, Oral Medicine and Oral Pathology, St. Louis, v13 n1 p117-20 Jan 1960.

Descriptors: (*Lactobacillus acidophilus, Antarctic regions), Dentistry, Mouth, Diseases, Pathology, Saliva, Intestines.

Continued exposure to reduced environmental temperatures at low humidities which caused mouth breathing resulted in reduced oral temperatures and lowered Lactobacillus acidophilus counts. These counts, retaken a month after the men had been living in a warmer environment, return to original levels. Measurements made on lactobacillus found in stools showed no such correlation with environmental temperature over the period studied. It is suggested that the quantities of lactobacillus counted in saliva do correlate with environmental temperatures. (Author)

AD-639 121 **Field 6E, 6F**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
REDUCED ORAL TEMPERATURES AND ACID PRODUCTION RATES IN DENTAL PLAQUES.
Revised ed.
by William R. Stanmeyer, and Robert J. Adams.
13 Apr 59, 5p Rept. no. 334
Revision of manuscript submitted 5 Feb 59.
Availability: Published in Journal of Dental Research v38 n5 p905-9 Sep-Oct 1959.

Descriptors: (*Dentistry, Antarctic regions), (*Teeth, Diseases), (*Lactobacillus acidophilus, Antarctic regions), Mouth, Temperature, pH, Exposure, Viability, Pathology.

Changes were measured in the pH of 176 dental plaques on men living in Antarctica following a carbohydrate rinse given at room temperature and a second rinse given 75 minutes later. The intervening time was spent in temperatures ranging from-31F. to -57F. The first rinse showed the usual increase in plaque acidity. The second rinse produced no such increase, and thus indicated that the exposure to cold greatly inhibited or completely attenuated bacterial action. Lactobacillus counts taken at room temperature and retaken after the subjects' exposure to the cold showed a marked decrease. Decrease in bacterial action was found to be positively correlated with decrease in tooth surface temperatures. (Author)

AD-639 194 **Field 6E, 5B**
CFSTI Prices: HC$1.00 MF$0.50
Tulane Univ., New Orleans, La. Div. of Medical Computing Sciences.
FINAL REPORT OF INFORMATION PROCESSING RESEARCH.
31 May 66, 9p
Contract AF 41 (609)-2032
Proj. AF-7755
Task 775501
Final rept. on basic rept titled: Clinical Record Information Processing in an Operational Environment, dated 15 Jul 65.

Descriptors: (*Hospitals, Data processing systems), Medicine, Diagnosis, Surgery, Therapy, Medical personnel, Information retrieval.

The project on clinical information processing centered primarily in the Orthopedic Outpatient Clinic and encompassed: data gathering; information retrieval; report design; and patient information. Upon development of the Change of Status form, data processing was expended to the inpatient Orthopedic Service. Operating procedures were devised and tested for gathering patient information without the requirement for professional personnel to record information in duplicate. Gathering of information by personnel who were vitally concerned or interested in the success of the program virtually eliminated the recording of inaccurate information. (Author)

AD-639 243 **Field 6E, 14B**
CFSTI Prices: HC$1.10 MF$0.50
Naval Medical Research Lab., New London, Conn.
PROCEDURES FOR ADEQUATE ELECTROACOUSTICAL CALIBRATION OF AUDIOMETERS.
Memo rept.
by J. Donald Harris. 1 Nov 62, 7p MR-62-6
NAVMED-MR005.14-1001-3.04

Descriptors: (*Audiometry, Calibration), Maintenance.

Conclusions: The audiometrist should initially check an instrument for obvious defects as it comes from the factory, and should monitor it continuously as best he can with his own or other normal ears, or with an artificial ear if available, remembering that intensity output is only one of a half-dozen equally important aspects which may lose calibration. Only a facility which serves many clinics (approximately 500 audiometers) should hire an electroacoustic technician-audiologist team, and install and maintain the approximately $10,000 worth of calibration equipment necessary in a complete secondary calibration center. A primary calibration center should monitor the instruments and procedures of the secondary centers, and could serve as a research laboratory to refine the calibration procedures and as an informal exchange library for research data in this limited area. (Author)

AD-639 400 **Field 6E**
CFSTI Prices: HC$1.00 MF$0.50
Army Biological Labs., Frederick, Md.
SEROLOGICAL EPIDEMIOLOGY, BY K. G. VASILEV: BOOK REVIEW.
by I. I. Shatrov. Jul 65. 9p Trans-1612
TT-66-62326
Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR), v42 n2 p152-5 1965.

Descriptors: (*Epidemiology, *Serodiagnosis), Public health, Medicine, Virus diseases, Antigens+antibodies, Vaccines, Immunity, Allergy, Infectious diseases, Disease vectors, Reviews, USSR.

Identifiers: Book reviews.

AD-639 402 **Field 6E, 5I**
CFSTI Prices: HC$1.00 MF$0.50
Army Biological Labs., Frederick, Md.
INSTRUCTION IN EPIDEMIOLOGY AT THE DONETS MEDICAL INSTITUTE.
by N. Kh. Shteinbakh. 25 Dec 63, 8p Trans-1392
TT-66-62324
Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR), v41 n6 p7-12 1964.

Descriptors: (*Epidemiology, *Education), (*Medical personnel, Education), Teaching methods, USSR.

AD-639 580 **Field 6E, 5J**
CFSTI Prices: HC$2.00 MF$0.50
Naval Aerospace Medical Inst., Pensacola, Fla.
SUICIDE ATTEMPTS.
by Gary J. Tucker, and Roger F. Reinhardt. Aug 66, 26p NAMI-975
NAVMED-MR005.04-0017-1

Descriptors: (*Psychiatry, *Naval personnel), Behavior, Abnormal psychology, Adjustment (Psychology), Stress (Psychology), Diagnosis, Therapy, Statistical analysis.

The military physician is frequently confronted by patients who have made a suicide attempt. In an attempt to clarify the significance of these suicide attempts in the military, all patients who had made a suicide attempt in a nine-month period, and who were seen by the psychiatric staff of the U. S. Naval Aviation Medical Center, were retrospectively studied (N = 42). The suicide group was compared on 35 demographic, historical, and clinical variables to two control populations: 1) randomly selected psychiatric in-patients (N = 20) who did not make a suicide attempt; 2) well-adjusted enlisted men seen for administrative screening evaluations (N = 30). The suicide group and the psychiatric control group were followed 9 to 18 months after initial psychiatric contact. All data were statistically analyzed. From these data emerged statistically significant guidelines for the evaluation, treatment, and disposition of suicidal patients by the military psychiatrist. (Author)

AD-639 596 **Field 6E, 20K**
Not available from CFSTI.
Pitman-Dunn Research Labs., Frankford Arsenal, Philadelphia, Pa.
DYNAMIC PHOTOELASTIC STRESS PATTERNS FROM A SIMPLIFIED MODEL OF THE HEAD.
Technical research article.
by Paul D. Flynn. Feb 66, 8p
Proj. DA-1P014501B33A
FA-A66-9
Availability: Published in Head Injury Conference Proceedings p344-9 1966.

Descriptors: (*Head, Wounds + injuries), (*Stresses, Head), (*Photoelasticity, Anatomical models), Strain (Mechanics), Loading (Mechanics), Test methods.

Photoelasticity is a method of experimental stress analysis employing polarized light and transparent

models. Dynamic photoelasticity generally deals with the determination of transient stresses and strains in machine parts or structures subjected to impact or shock loading. The potential value of this technic in head injury research is illustrated by stress patterns of a simplified model of a skull and brain under dynamic loads that were photographed at a rate of 240,000 pictures per second. The results are compared with stress patterns obtained from the same model under static loads. (Author)

N66-24908 **Field 6E**
CFSTI Prices HC$5.00 MF$1.25
National Aeronautics And Space Administration, Washington, D. C.
ELECTROCARDIOGRAPHY.
by H. C. Burger. Dec 65, 195p NASA-TT-F-9772
Transl. Into English Of The Book "de Electrische Werking Van Het Hart" 1963

Descriptors: Dipole, *Electrocardiography, Equipment, Heart, Histology, Instrumentation, Medical, *Medicine, *Physiology, Technique, Vector, *Vectorcardiogram.

For abstract, see S 04 13.

N66-24915 **Field 6E**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
USE OF INTERFERENTIAL CURRENTS IN COMBINED ANESTHESIA IN SURGERY.
Primeneniye Interferentsionnykh Tokov V Kombinirovannom Obezbolivanii Pri Khirurgicheskikh Operatsiyakh
by M. I. Kuzin, V. I. Sachkov, and V. D. Zhukovskiy. Apr 66, 14p NASA-TT-F-10090
Transl. Into English From Russian

Descriptors: Analgesia, Current, Electric, *Electric current, Electroanesthesia, *Electronarcosis, *Interference, Medicine, Patient, Physiology, *Surgery.

For abstract, see S 04 13.

N66-25341 **Field 6E, 6R**
CFSTI Prices HC$1.00 MF$0.50
Institute Of Cancer Research. Royal Cancer Hospital, London (England).
TISSUE THERAPY AFTER IRRADIATION.
by P. C. Koller. 1964, 11p TID-21799
Contracts IAEA-103/3/US/, AT/30-1/-2702

Descriptors: Antigen, Biological, Blood, *Blood group, Bone, *Bone marrow, Cell, Effect, Grafting, Group, *Hematopoietic system, Hemorrhage, Injection, Mice, Radiation, *Radiation effect, Skin, Spleen, Surgery, *Therapy, Thymus.

For abstract, see S 04 13.

N66-25578 **Field 6E**
CFSTI Prices HC$7.00 MF$3.50
National Aeronautics And Space Administration, Washington, D. C.
AEROSPACE MEDICINE AND BIOLOGY A CUMULATIVE INDEX TO THE 1965 ISSUES OF A CONTINUING BIBLIOGRAPHY.
Apr 66, 725p NASA-SP-7011/20/

Descriptors: Aerospace, *Aerospace medicine, Author, *Bibliography, *Biology, Index, Information, Literature, Medicine, *Nasa program, Publication, Research, Science, Source, Subject.

For abstract, see S 04 14.

N66-26777 **Field 6E**
CFSTI Prices HC$2.00 MF$0.50
Technisch Documentatie En Informatie Centrum Voor De Krijgsmacht, The Hague (Netherlands).
REVIEW OF LITERATURE ON MILITARY MEDICINE.
Literatuuroverzicht Militaire Geneeskunde
15 Mar 66, 31p
In Dutch, English, German, And French Its Vol. 12, No. G-128

Descriptors: *Abstract, Aerospace, *Aerospace medicine, Annotation, *Bibliography, *Biology, Biomechanics, Hazard, Internal, Medicine, Pharmacology, Psychiatry, *Psychology (gen), Radiation, *Radiation medicine, Surgery, Toxicology.

For abstract, see S 04 14.

N66-35142 **Field 6E, 6I**
CFSTI Prices HC$2.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
SOME COMPARATIVE CONSIDERATIONS ON PUBLIC HEALTH ORGANIZATION IN ITALY AND IN THE USA AND THE PROBLEM OF SANITARY SCIENTIFIC RESEARCH.
Considerazioni Comparative Sulla Organizzazio-Ne Della Sanita Pubblica In Italia E Negli Stati Uniti In Connessione Con Il Problema Della Ricerca Scientifica In Campo Sanitario
by G. Cortellessa. 19 Dec 65, 30p ISS-65/47
In Italian, English Summary

Descriptors: Activity, Agency, Atmosphere, Comparison, Contamination, Government, *Health, *Italy, Pollution, Research, *Sanitation, *United states, Water.

For abstract, see S 04 20.

AD-638 771 **See Field 6A**

AD-638 813 **See Field 6O**

AD-638 933 **See Field 6O**

AD-638 937 **See Field 6O**

AD-638 940 **See Field 6C**

AD-638 990 **See Field 6A**

AD-639 069 **See Field 6O**

AD-639 073 **See Field 6M**

AD-639 090 **See Field 6P**

AD-639 188 **See Field 6A**

AD-639 332 **See Field 6A**

AD-639 399 **See Field 6M**

PB-172 423 **See Field 6B**

6F. ENVIRONMENTAL BIOLOGY

N66-24690 **Field 6F**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
STERILIZATION - A SELECTED BIBLIOGRAPHY FROM THE LITERATURE RETRIEVAL SYSTEM,'SPACE BIOLOGY BRANCH.
Mar 66, 25p NASA-TM-X-55457, X-450-66-53

Descriptors: Air, *Bibliography, Chemical, *Chemical sterilization, Clean, *Clean room, *Decontamination, Detection, Filtering, Heat, *Microorganism, Room, Spacecraft, *Spacecraft sterilization, *Sterilization, Viability.

For abstract, see S 04 13.

N66-24944 **Field 6F**
CFSTI Prices HC$2.00 MF$0.50
Naval School Of Aviation Medicine, Pensacola, Fla.
SEA URCHIN MITOSIS IN HIGH MAGNETIC FIELDS.
by V. R. Reno. 1 Feb 66, 26p NASA-CR-74592, NAMI-954
NASA ORDER R-39
Its Rept.-9

Descriptors: *Biochemistry, *Biology, Delay, Dimagnetism, Egg, Field, Magnetic, *Magnetic field, *Mitosis, Nitrogen, Oxygen, Paramagnetism, Property, Retardation.

For abstract, see S 04 13.

N66-26263 **Field 6F**
CFSTI Prices HC$1.00 MF$0.50
Iit Research Inst., Chicago, Ill.
LIFE IN EXTRATERRESTRIAL ENVIRONMENTS QUARTERLY STATUS REPORT, FEB. 15 - MAY 15, 1966.
by C. A. Hagen. 1966, 24p NASA-CR-74969, IITRI-L6023-5
Contract NASR-22

Descriptors: Acidity, Atmosphere, *Bacillus, Bacteria, Carbon dioxide, Cell, Concentration, Earth, *Ecology, Environment, *Germination, Growth, Mars (planet), *Mars environment, Planetary, *Planetary atmosphere, Pressure, Soil, *Spore.

For abstract, see S 04 14.

N66-34663 **Field 6F**
CFSTI Prices HC$3.00 MF$0.50
Oklahoma City Univ., Okla.
INTERDISCIPLINARY STUDIES OF THE EFFECTS OF THE SPACE ENVIRONMENT ON BIOLOGICAL SYSTEMS SEMIANNUAL STATUS REPORT.
30 Apr 66, 54p NASA-CR-77216
Grant NSG-300-63

Descriptors: *Adaptation, Adrenal, Animal, Environment, Eye, Gland, Liver, *Metabolism, *Rat, Respiration, Simulation, Space, *Space environment, Study.

For abstract, see S 04 20.

N66-34795 **Field 6F**
CFSTI Prices HC$2.00 MF$0.50
Stanford Univ., Calif.
CYTOCHEMICAL STUDIES OF PLANETARY MICROORGANISMS - EXPLORATIONS IN EXOBIOLOGY STATUS REPORT, SEP. 1, 1965 - APR. 1, 1966.
by J. Lederberg, and E. C. Levinthal. 1966, 1p NASA-CR-77175, IRL-1050
Grant NSG-81-60

Descriptors: Chromatography, Computer, *Computer method, Cytology, Enzyme, Extraterrestrial, *Extraterrestrial life, Fluoroscopy, Gas, *Gas chromatography, Instrumentation, Life, Mass, *Mass spectrometry, Method, Microorganism, Multivator, Optical, Planetary, Resolution, Spectrometry.

For abstract, see S 04 20.

PB-170 827 **Field 6F, 6T**
CFSTI Prices: HC$1.10 MF$0.50
Civil Aeromedical Research Inst., Oklahoma City, Okla.
PROBLEMS IN AERIAL APPLICATION: A COMPARISON OF THE EFFECTS OF DIELDRIN POISONING IN COLD-ADAPTED AND ROOM-TEMPERATURE MAMMALS.
by George Clark. Apr 66, 8p
AM-66-5

Descriptors: (*Insecticides, Poisoning), Liver, Phospholipids, Adaptation (Physiology), Acclimatization, Toxicity, Histology, Ribonucleic acids, Rats.

Identifiers: Dieldrin.

The effects of dieldrin poisoning on the liver were compared in cold-adapted rats and normal rats. One-fourth of the cold-adapted rats succumbed to the poisoning while all of the normal rats survived. There were minimal fat deposits in both groups, but the cold-adapted rats were least affected. By contrast, cytoplasmic RNA was altered to a greater extent in the cold-adapted rats, although with both the changes were located periportally. Another stain that is probably specific for secondary amines was increased in both treated groups but was decreased in cold adaptation. (Author)

AD-639 119 **See Field 6E**

AD-639 121 **See Field 6E**

6G. ESCAPE, RESCUE, AND SURVIVAL

AD-639 169 **Field 6G**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
ESCAPES FROM SINKING JET AIRCRAFT COCKPITS.
Memo rept.
by George F. Bond. 25 May 59, 24p MR-59-2
NAVMED-NM-24-03-20

Descriptors: (*Abandonment, Underwater), (*Jet planes, Abandonment), Pilots, Survival, Cockpits, Test methods.

The report presents the findings derived from a large series of underwater escapes, performed both at New London and at Key West. The purpose of these tests was to determine, as a part of a NavDevCen Project, whether it would be possible for a pilot to make an unassisted escape from various jet cockpit assemblies, in simulated nose-sink and tail-sink attitudes, with canopy on and off, and increasing sink-rates up to a maximum of seven knots. The necessary simulated conditions were achieved by securing the cockpit assembly to be tested on the afterdeck of a submarine, which then submerged, with the test subject in the cockpit, and reached the designated underwater speeds, at which time the test subject attempted to make an egress. In all, about forty egresses were completed without serious casualty. As a result of this escape series, it would appear that the pilot, if trained in buoyant ascent, and not severely disabled, should be able to escape from these types of jet aircraft at maximum sink-rates. (Author)

6H. FOOD

AD-639 494 **Field 6H**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
FOODS FOR COSMONAUTS.
15 Jun 66, 4p FTD-HT-66-225
TT-66-62355
Unedited rough draft trans. of Sovetskaya Estoniya (Estonian SSR), 14 Nov p4 1964.

Descriptors: (*Dehydrated foods, Astronauts), Food, Packaging, Processing.

AD-639 510 **Field 6H**
CFSTI Prices: HC$6.00 MF$1.50
Army Combat Developments Command. Quartermaster Agency, Fort Lee, Va.
SUBSISTENCE AND FOOD SERVICE FOR THE ARMY IN THE FIELD.
Jul 66, 296p

Descriptors: (*Food, Military requirements), (*Military rations, Army), (*Food dispensing, Warfare), Kitchen equipment + supplies, Army personnel, Cold war, Limited war, Preservation, Processing, Food, Dehydrated foods, Packaging.

The study determines operational and organizational concepts to meet subsistence and food service requirements for the army in the field during the period 1965-1970. Based upon evaluation of data from many sources, a field food system is developed, keyed to tactical and logistical concepts of the RODAC-70 and TASTA-70 studies. This system is capable of immediate implementation and evolutionary improvement taking advantage of technological developments as they occur. The study considers application of the field food system in various levels of conflict from cold war to general war and special US Army subsistence responsibilities in a theater of operations. (Author)

6I. HYGIENE AND SANITATION

N66-35142 **See Field 6E**

6J. INDUSTRIAL (OCCUPATIONAL) MEDICINE

AD-639 103 **See Field 17B**

AD-639 363 **See Field 6S**

6K. LIFE SUPPORT

AD-639 060 **Field 6K, 6T, 22B**
CFSTI Prices: HC$1.00 MF$0.50
Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
TOXICOLOGICAL EVALUATION OF MATERIALS ASSOCIATED WITH SPACECRAFT.
by Kenneth C. Back. Jun 66, 13p AMRL-TR-66-69
Proj. AF-6302
Task 630201
Presented at the AIAA/ASME Structures and Materials Conference (7th), Cocoa Beach, Fla., Apr 66.

Descriptors: (*Closed ecological systems, Toxicity), Spacecraft cabins, Contamination, Life support, Hazards, Oxygen, Materials, Tolerances (Physiology), Confined environments, Air pollution, Space medicine.

The Air Force has pursued research in areas of ground support and space cabin toxicology for the past 5 years. Comprehensive treatment of toxicological problems in both areas has revealed the necessity to define human tolerance limits to propellants and other toxic materials for various durations of exposure. Hence, an integrated input of propellant and space cabin material toxicology provides the basis for selection of habitable cabin atmospheres and materials selection criteria. Since such selection procedures are based on both biological and engineering considerations, one cannot disregard the materials selection aspect or evaluate closed system toxicology without consideration of source. The toxic materials in space system atmospheres are determined primarily by the qualitative and quantitative composition of space cabin equipment and the contribution of contaminants by the crew. Materials selection and analytical studies on gas-off products are key considerations in controlling toxic contaminants in a space cabin. Methods are described to determine the composition of cabin materials gas-off products and to biologically test these compounds for their toxicological effects. An attempt is made to correlate the roles of the materials analytical chemist and the toxicologist as a working team to provide meaningful and useful materials selection criteria. (Author)

AD-639 145 **Field 6K**
CFSTI Prices: HC$1.00 MF$0.50
Naval Research Lab., Washington, D. C.
METHOD FOR ON-SITE DETERMINATION OF RESIDUAL ADSORPTIVE CAPACITY OF CHARCOALS USED IN CLOSED ENVIRONMENTAL SYSTEMS.
Memo rept.
by D. L. Venezky, and W. B. Moniz. 31 Aug 66, 21p NRL-MR-1710

Descriptors: (*Charcoal, Adsorption), (*Air flow, Test methods), Closed ecological systems, Submarines, Life support, Organic compounds, Moisture, Monitors.

The relationship between the moisture content of adsorbent-type charcoals and their residual adsorptive capacity for organic compounds was studied. Investigation of fourteen charcoal samples from submarine main-carbon filters has shown that the moisture content of the charcoals correlates with the organic loading previously determined by a steam desorption method. A simple apparatus for determining the moisture content of a charcoal sample was devised. The on-site determination of the residual adsorptive capacity of main-filter charcoals is suggested by the low cost of the closed-loop apparatus and the simplicity of the method. Since seventy percent of the charcoal samples which were investigated had more than half of their adsorptive capacity remaining, substantial savings should result.

AD-639 204 **Field 6K, 22B**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
INERT GAS COMPONENTS FOR SPACE CAPSULE ATMOSPHERES.
Memo. rept.
by George F. Bond. 8 Apr 63, 11p MR-63-4
NAVMED-MR005.14-3002-9.02

Descriptors: (*Life support, *Helium group gases), (*Closed ecological systems, Helium group gases), (*Spacecraft cabins, Helium group gases), Helium, Argon, Neon, Krypton, Xenon, Space flight, Manned spacecraft, Respiration, Toxicity, Astronauts.

The potential values of several inert gases are surveyed for use in space cabin atmospheres. Helium, argon, neon, krypton, and xenon are briefly discussed. It is concluded that two of these elements, namely, helium and neon, are worthy of serious consideration for use in space travel.

AD-639 582 **Field 6K, 7A, 13J**
CFSTI Prices: HC$1.00 MF$0.50
Navy Marine Engineering Lab., Annapolis, Md.
FUNDAMENTALS OF AIR PURIFICATION (ADSORPTION AND CATALYTIC OXIDATION).
Technical memo.
by W. R. Calvert. Aug 66, 17p MEL-364/66
Projs. S-R011-01-01, S-F013-08-03
Tasks 0401, 4095

Descriptors: (*Controlled atmospheres, Purification), (*Air, Purification), Adsorption, Oxidation, Catalysis, Closed ecological systems, Submarines.

Identifiers: Adsorbents.

The paper describes phenomena occurring during employment of adsorbents and oxidation catalysts in air purification. (Author)

AD-639 583 **Field 6K, 7A, 13J**
CFSTI Prices: HC$1.00 MF$0.50
Navy Marine Engineering Lab., Annapolis, Md.
AN ADSORBENT FOR PROVIDING CLEAN AIR IN SUBMARINES.
Research and development phase rept.
by W. R. Calvert. Aug 66, 19p MEL-340/66
Proj. S-F013-08-03
Task 4095

Descriptors: (*Controlled atmospheres, Purification), (*Air, Purification), (*Submarines

Life support), Adsorption, Graphics, Gas Chromatography, Aluminum compounds, Silicates.

Identifiers: Adsorbants, Aluminosilicates.

Aligned data curves are presented which bring into focus several of the important variables existing in air purification by adsorption. Using bench scale apparatus, an adsorbent designated MS 544 was shown to be better than adsorbent carbon for cleaning air by removing CO2, Freon-11, and Freon-12. (Author)

N66-25581 **Field 6K**
CFSTI Prices HC$3.00 MF$0.50
Ltv Aerospace Corp., Dallas, Tex.
UNMANNED EXTRAVEHICULAR ENVIRONMENTS OPERATION QUALIFICATION TEST OF THE GEMINI EXTRAVEHICULAR SUPPORT PACKAGE AND EXTENDED UMBILICAL TEST PLAN.
by B. W. Tyler. 24 Nov 65, 58p NASA-CR-65357
Contract NAS9-3414
Its Rept.-00.724

Descriptors: Environment, *Extravehicular operation, *Gemini project, Operation, Pressure, Qualification, Radiation, Solar, Space, *Space environment, Support, *Support system, System, Temperature, Umbilical, Unmanned.

For abstract, see S 04 14.

N66-25582 **Field 6K**
CFSTI Prices HC$3.00 MF$0.75
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
MSC AIR EVAPORATION WATER RECLAMATION SYSTEM FINAL REPORT.
by H. Kolnsberg. 11 Aug 65, 69p NASA-CR-65345
Contract NAS9-3796

Descriptors: Air, Automatic, *Evaporation, Field, Gravity, Impurity, Method, Operation, Performance, Potability, *Potable water, Purification, Recovery, Spacecraft, System, *Urine, Water, *Water recovery, Zero.

For abstract, see S 04 14.

N66-26122 **Field 6K**
CFSTI Prices HC$3.00 MF$0.75
Honeywell, Inc., Hopkins, Minn.
TRACE MATERIAL GENERATION RATE SIMULATOR, APPENDIX B. PART B - STUDY OF GENERATION RATE PATTERNS FINAL REPORT.
9 Jun 65, 90p NASA-CR-65347
Contract NAS9-3998
Prepared By North Star Res. And Develop. Inst. For Honeywell

Descriptors: *Contaminant, Control, Element, Gas, Generation, Material, *Mathematical model, Mathematics, Model, Pattern, Rate, Rating, Relative, Simulator, Stabilization, System, *Toxicity, Trace, *Trace element.

For abstract, see S 04 14.

N66-26844 **Field 6K**
CFSTI Prices HC$6.00 MF$1.25
Hamilton Standard Div., United Aircraft Corp., Broad Brook, Conn.
MARS LANDING AND RECONNAISSANCE MISSION ENVIRONMENTAL CONTROL AND LIFE SUPPORT SYSTEM STUDY FOURTH MONTHLY PROGRESS REPORT (MID TERM).
by K. L. Hower. 16 Dec 63, 232p NASA-CR-75250, SLS-404
Contract NAS9-1701

Descriptors: Analysis, Atmosphere, Atmospheric, Cabin, Conditioning, Control, Environment, *Environmental control, Instrumentation, Landing, Life, *Life support system, Management, Mars (planet), Mission, Reconnaissance, Space, *Space cabin atmosphere, Spacecraft, *Spacecraft environment, Subsystem, Supply, Support, System, Thermal, Water.

For abstract, see S 04 14.

N66-34862 **Field 6K**
CFSTI Prices HC$4.00 MF$0.75
General American Transportation Corp., Niles, Ill.
A WASTE MANAGEMENT SUBSYSTEM FINAL TECHNICAL REPORT.
by T. L. Hurley, J. Rest, and J. D. Zeff. Dec 63, 106p NASA-CR-66124, MR-1210-8090
Contract NAS1-2193

Descriptors: Development, Disposal, Ecology, Evaluation, Life, *Life support system, Man, Management, *Manned orbital space station (moss), Orbit, Regeneration, Space, Station, Subsystem, Support, System, Waste, *Waste disposal.

For abstract, see S 04 20.

N66-35321 **Field 6K**
CFSTI Prices HC$3.00 MF$0.75
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
AN IMPROVED WATER RECLAMATION SYSTEM UTILIZING A MEMBRANE VAPOR DIFFUSION STILL CONCEPT.
by W. B. Coe, and H. J. Kolnsberg. 1966, 114p NASA-CR-66154, SVHSER-4082
Contract NAS1-5312

Descriptors: Change, Condensation, Design, *Diffusion, Evaporation, Exchange, Ion, *Ion exchange membrane, Membrane, Phase, Potability, *Potable water, Pressure, Reclamation, Recovery, Still, System, Technique, Test, *Urine, Vapor, Water, *Water recovery.

For abstract, see S 04 20.

6L. MEDICAL AND HOSPITAL EQUIPMENT

AD-639 042 **Field 6L**
Not available from CFSTI.
Tufts Coll., Medford, Mass. Inst. for Applied Experimental Psychology.
SURFACE ELECTRODES FOR RECORDING BIOELECTRIC POTENTIALS.
by John L. Kennedy, and Roland C. Travis. 1948, 2p
SPECDEVCEN-58-2-7
Availability: Published in Science v108 n2799 p183 Aug 20 1948.

Descriptors: (*Electrodes, Medical equipment), Skin, Surfaces, Voltage, Electrophysiology, Recording systems.

AD-639 373 **Field 6L**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
SUPRA-AURAL CUSHIONS IN AUDIOMETRY.
Memo rept.
by Russell L. Sergeant, and J. Donald Harris. 17 Mar 61, 3p MR-61-10
NAVMED-MR005.14-0100-1.04
Availability: Published in The Journal of the Acoustical Society of America v33 n7 p966 Jul 1961.

Descriptors: (*Audiometry, Test equipment), Hearing, Tests, Earphones, Thresholds (Physiology).

Differences in median audiometric thresholds for 20 subjects resulting from embedding earphones in the standard MX-41/AR muff and in the Willson 'Sound Barrier' supra-aural muff are presented. Applying these corrections to the Willson muff with its much superior sound-attenuation properties makes possible threshold audiometry in much noisier workspaces than heretofore. (Author)

AD-639 615 **See Field 6S**

6M. MICROBIOLOGY

AD-638 764 **Field 6M**
Not available from CFSTI.
Columbia Univ., New York. Coll. of Physicians and Surgeons.
STUDIES WITH HYDROXYUREA. II. PROLONGED EXPOSURE OF ESCHERICHIA COLI TO HYDROXYUREA.
by Herbert S. Rosenkranz, and Howard S. Carr. 28 Mar 66, 9p
Contract Nonr-266 (89)
Proj. NR-103-574
Availability: Published in Journal of Bacteriology v92 n1 p178-85 Jul 1966.

Descriptors: (*Escherichia coli, Antimetabolites), (*Desoxyribonucleic acids, Inhibition), Ribonucleic acids, Biosynthesis, Proteins, Nucleotides, Ureides, Alcohols, Growth, Viability, Metabolism.

Identifiers: Thymine, Hydroxyurea.

Concurrent with an inhibition of the synthesis of deoxyribonucleic acid, hydroxyurea devitalized Escherichia coli when exposure to the drug was prolonged to more than 3 hr. Active protein synthesis, but not ribonucleic acid (RNA) production, was a prerequisite for this lethal action. These findings are contrasted to thymineless death, which requires RNA synthesis. (Author)

AD-638 885 **Field 6M**
Not available from CFSTI.
Brussels Univ. (Belgium). Laboratoire de Genetique.
LA SYNTHESE DES ACIDES DESOXYRIBONUCLEIQUES CHEZ ESCHERICHIA COLI INFECTE PAR UN BACTERIOPHAGE TEMPERE (The Synthesis of Ribonucleic Acid by Escherichia Coli Infected with a Heat Sensitive Bacteriophage.
by L. H. Pereira da Silva, and R. Thomas. 1963, 3p
Grant AF-EOAR-62-17
Text in French.
Availability: Published in Archives Internationales de Physiologie et de Biochimie v71 n1 p133 1963.

Descriptors: (*Ribonucleic acids, Biosynthesis), (*Desoxyribonucleic acids, Biosynthesis), Culture media, Escherichia coli, Bacteriophages, Proteins, Belgium.

AD-638 887 **Field 6M**
Not available from CFSTI.
Brussels Univ. (Belgium). Laboratoire de Genetique.
LA SYNTHESE DES ACIDES DESOXYRIBONUCLEIQUES CHEZ ESCHERICHIA COLI INFECTE PAR UN BACTERIOPHAGE TEMPERE. IV. REPLICATION GENETIQUE SOUS INHIBITION DE LA SYNTHESE DES PROTEINES ET DES ACIDES RIBONUCLEIQUES (The Synthesis of Desoxyribonucleic Acid by Escherichia Coli Infected with a Heat Sensitive Bacteriophage. IV. Genetic Replication During Inhibition of the Synthesis of Proteins and Ribonucleic Acids).
by L. H. Pereira da Siva, and R. Thomas. 1963, 3p
Grant AF-EOAR-62-17
Text in French. See also AD-638 885.
Availability: Published in Archives Internationales de Physiologie et de Biochimie v71 n1 p135-7 1963.

Descriptors: (*Desoxyribonucleic acids, Biosynthesis), Escherichia coli, Bacteriophages, Genetics, Inhibition, Ribonucleic acids, Belgium.

AD-638 934 **Field 6M**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
PURIFICATION AND CHARACTERIZATION OF C. BOTULINUM TOXINS.
by Edward J. Schantz. 1965, 14p
Availability: Published in unidentified journal 14p.

Descriptors: (*Clostridium botulinum, *Toxins + antitoxins), Purification, Culture media, Toxicity, Enzymes, Amino acids, Biological assay, Vaccines, Reviews.

AD-638 935 **Field 6M**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
LOSS IN VIRULENCE OF YELLOW FEVER VIRUS SERIALLY PASSED IN HeLa CELLS.
by H. J. Hearn Jr, W. T. Soper, and W. S. Miller. 10 Feb 65, 4p
Availability: Published in Proceedings of the Society for Experimental Biology and Medicine v119 p319-22 1965.

Descriptors: (*Yellow fever virus, Tissue culture), Growth, Tissue culture cells, Adaptation (Physiology), Aerosols, Viability, Humidity, Stability.

Yellow fever virus that was passed one and three times in HeLa cells was characterized with respect to the following: (a) adaptation to growth in cell culture as indicated by the time required to obtain maximal titer, (b) level of titer, (c) production of a cytopathic effect (cpe), (d) stability of virus when aerosolized at either 50% or 80% relative humidity (RH), and (e) the loss of virulence of viral preparations for rhesus monkeys infected by the respiratory route. Four viral populations which possessed different combinations of these properties were obtained.

AD-638 981 **Field 6M, 6C**
CFSTI Prices: HC$2.00 MF$0.50
Biological Sciences Lab., Fort Detrick, Md. Entomology Div.
BIBLIOGRAPHY ON TISSUE CULTURES: INVERTEBRATES AND COLD-BLOODED CHORDATES.
by Mary Shipp Watson. Aug 66, 50p
Miscellaneous Pub-10
Proj. DA-1C522301A059
DA-FD-Miscellaneous Pub-10

Descriptors: (*Tissue culture, *Invertebrates), Platyhelminths, Nematodes, Annelida, Echinodermata, Mollusca, Arthropods, In vitro analysis, Indexes, Bibliographies.

Identifiers: Coelenterates, Chordates.

AD-639 071 **Field 6M**
Not available from CFSTI.
Walter Reed Army Inst. of Research, Washington, D. C. Dept. of Experimental Pathology.
THE FINE STRUCTURE OF THE ERYTHROCYTIC STAGES OF THREE AVIAN MALARIAL PARASITES, PLASMODIUM FALLAX, P. LOPHURAE, AND P. CATHEMERIUM.
Doctoral thesis.
by Masamichi Aikawa. 1966, 23p
Prepared in cooperation with Naval Medical Research Inst., Bethesda, Md., Dept. of Parasitology, and Kyoto Univ. (Japan).
Availability: Published in American Journal of Tropical Medicine and Hygiene v15 n4 p449-69 1966.

Descriptors: (*Plasmodium, Morphology (Biology)), (*Life cycle, Plasmodium), Erythrocytes, Cell structure, Diseases, Electron microscopy.

Merozoites of the plasmodia showed a highly complex structure including many organelles, such as conoid, paired organelles, dense bodies, spherical body, cytostome, pellicular complex, nucleus, mitochondrion, ribosomes and endoplasmic reticulum. The pellicular complex is composed of three distinct layers: a thin outer membrane, a thick interrupted inner membrane, and a layer of microtubules interior to both membrane systems. A nucleus is centrally located and its nucleoplasm is electron translucent with scattered particles. A mitochondrion is always situated posteriorly and is a crescent-shaped structure with a microtubular cristae, characteristic of protozoa. The capacity of erythrocytic merozoites to survive briefly in the free form, their motility and ability to enter a new host cell is probably related to certain organelles such as conoid, paired organelles, dense bodies and pellicular complex. When a merozoite infects a new host cell, it rounds up and loses much of its organelles, retaining only a nucleus, mitochondrion, endoplasmic reticulum, ribosomes, cytostome and a spherical body. As the parasite grows, the spherical body enlarges and becomes vacuolated and the mitochondrion increases in number.

AD-639 072 **Field 6M**
Not available from CFSTI.
SEATO Medical Research Lab., Bangkok (Thailand).
PATHOGENESIS OF EXPERIMENTAL CHOLERA: IDENTIFICATION OF CHOLERAGEN (PROCHOLERAGEN A) BY DISC IMMUNOELECTROPHORESIS AND ITS DIFFERENTIATION FROM CHOLERA MUCINASE.
by Richard A. Finkelstein, Philip Z. Sobocinski, Pongsom Atthasampunna, and Pichai Charunmethee. 21 Jan 66, 9p
Availability: Published in The Journal of Immunology v97 n1 p25-33 1966.

Descriptors: (*Cholera, Antigens + antibodies), Etiology, Vibrio, Electrophoresis, Enzymes, Mucin, Diarrhea, Permeability, Edema, Immunity, Thailand.

Identifiers: Choleragen.

Choleragen, an antigenic, choleragenic moiety elaborated by some cholera vibrio strains in vitro, has been identified by disc immunoelectrophoresis as a protein migrating in a manner similar to human 7 S gamma-globulin. Although preparations of choleragen have mucinolytic activity which is neutralized by antiserum against choleragen, the mucinase has been proven to be a separate entity which is not involved in the production of the diarrhea of experimental cholera. Similarly, it is choleragen, and not mucinase, which causes an increase of vascular permeability characterized by a delayed but sustained erythematous, edematous induration. Choleragen elaborated in vitro by an Ogawa serotype El Tor vibrio was serologically identical to that produced by the routinely used Inaba serotype classical cholera vibrio strain. (Author)

AD-639 073 **Field 6M, 6E**
Not available from CFSTI.
Walter Reed Army Inst. of Research, Washington, D. C. Dept. of Virus Diseases.
RECOVERY OF DENGUE VIRUSES FROM PATIENTS DURING EPIDEMICS IN PUERTO RICO AND EAST PAKISTAN.
by Philip K. Russell, Edward L. Buescher, Jack M. McCown, and Jose Ordonez. 1966, 7p
Prepared in cooperation with Maryland Univ., Baltimore, Dept. of Microbiology.
Availability: Published in American Journal of Tropical Medicine and Hygiene v15 n4 p573-9 1966.

Descriptors: (*Dengue, Tissue culture), (*Epidemiology, Dengue), Tissue culture cells, Sensitivity, Resistance (Biological), Serodiagnosis, Etiology, Antigens + antibodies, Test methods, Puerto Rico, Pakistan.

Identifiers: Hemagglutination-inhibition tests.

Viruses, closely related if not identical to dengue virus type 3, were recovered from the acute phase bloods of persons with clinical dengue fever in outbreaks in Puerto Rico (1963) and East Pakistan (1964). Because viruses from each epidemic induced little if any overt disease upon inoculation of suckling or weanling mice, the recovery and identification of these viruses were dependent entirely upon cell culture techniques using the challenge virus resistance test. Monolayer cultures of primary African green monkey kidney (GMK) cells, or continuous heteroploid GMK cells (BS-C-1) were found to be more sensitive for detection of dengue viruses than was the diploid early passage BS-C-1 cell. Titrations of newly recovered viruses were regularly and reproducibly made in the former cells. Titers of cell culture propagated dengue viruses were too low to permit demonstration of complement fixing or hemagglutinating antigen, but adequate for performance of neutralization tests to identify newly recovered strains. The techniques ultimately developed for recovery and characterization of dengue viruses in the GMK cell culture system are described. (Author)

AD-639 074 **Field 6M**
Not available from CFSTI.
Walter Reed Army Inst. of Research, Washington, D. C.
PROTECTION OF MONKEYS AGAINST EXPERIMENTAL SHIGELLOSIS WITH A LIVING ATTENUATED ORAL POLYVALENT DYSENTERY VACCINE.
by Samuel B. Formal, T. H. Kent, H. C. May, A. Palmer, and S. Falkow. 14 Mar 66, 6p
Prepared in cooperation with National Institutes of Health, Bethesda, Md.
Availability: Published in Journal of Bacteriology v92 n1 p17-22 Jul 1966.

Descriptors: (*Shigella, Vaccines), Viability, Immunity, Dysentery, Shigella flexneri, Shigella sonnei, Escherichia coli, Antigens + antibodies, Monkeys, Diseases.

Virulent strains of Shigella flexneri 1b, S. flexneri 3, and S. sonnei 1 were mated with an Hfr strain of Escherichia coli K-12, and hybrids were selected for the xylose marker. One hybrid strain of each of the serotypes was chosen for study of their biological characteristics. Their capacity to cause a fatal enteric infection in starved guinea pigs was reduced, they failed to cause dysentery when fed to monkeys, they caused keratoconjunctivitis in the guinea pig eye, and they penetrated HeLa cells. Two doses of a polyvalent oral vaccine composed of S. flexneri 1b, 2a, and 3, and S. sonnei 1 hybrid strains were fed to groups of monkeys at an interval of 4 to 7 days, and they, together with controls, were challenged 10 days after the last dose with one or another of the virulent parent dysentery strains. A significant degree of protection was afforded in all vaccinated groups with the exception of one group challenged with S. flexneri 6, a component not included in the vaccine. When animals were challenged with virulent S. flexneri 2a 1 month after oral vaccination, they were also protected. The vaccine produced a rise in serum antibody, but coproantibody was not detectable in saline extracts of feces from animals which received the vaccine. (Author)

AD-639 399 **Field 6M, 6E**
CFSTI Prices: HC$1.00 MF$0.50
Army Biological Labs., Frederick, Md.
A STUDY OF THE BIOLOGICAL ESSENCE OF THE VIRULENTproperties of microbes. report ii. the nature of pneumococcus infection in white mice depending on the route of infection and the dose of causative agent.
by S. A. Anatolii. 18 Jul 63, 9p Trans-1604
TT-66-62327
Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR), v42 n2 p120-4 1965.

Descriptors: (*Immunity, Diplococcus pneumoniae), (*Diplococcus pneumoniae, Infec-

tions), Dosage, Diseases, Viability, Extremities, Respiration, Injection (Medicine), Culture media, Resistance (Biological), Agglutinins, Penicillins, Blood, Mice, USSR.

Following the infection of mice with pneumococci the following gradation in the decrease of sensitivity of the animals was established depending on the route of introduction of the microbes: Intraperitoneal injection, infection in the extremity, in the vein, and by the intranasal route. Under specific conditions (infection with small doses in the extremity or infection following the use of moderate penicillin therapy) it is possible to observe a rapidly passing and weakly expressed bacteremia. The animals in which bacteremia was detected remained alive in a great number of cases. The temporary and scanty bacteremia following infection of mice in the extremity, and also the symptomless process following the intranasal infection of animals, caused a profound immunological reorganization in them, as a result of which the mice became highly resistant to pneumococcus infection. This immunological response was not accompanied by the formation of specific agglutinins. (Author)

AD-639 403 **Field 6M**
CFSTI Prices: HC$1.00 MF$0.50
Army Biological Labs., Frederick, Md.
THE SIGNIFICANCE OF TYPE E BOTULINUM TOXIN ACTIVATION IN THE LABORATORY DIAGNOSIS OF BOTULISM.
by T. I. Bulatova. 14 Jan 63, 10p Trans-1406
Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, (USSR), v42 n8 p97-101 1965.
Included in TT-64-51183.

Descriptors: (*Clostridium botulinum, Toxins + antitoxins), Culture media, Toxicity, Tests, Enzymes, Diagnosis, USSR.

Conclusions: On artificial nutrient media, Cl. botulinum produces a toxin and a nontoxic prototoxin. The latter may be transformed into a toxin due to the action of various enzymes (pancreatin, proteinase of Cl. sporogenes). When botulinum prototoxin type E reaches the digestive tract its activation by enzymes takes place. As a result of this the toxic effect on the organism is strengthened. During the investigation of various materials (food products, discharges from a patient, section material, original seedings) for the presence of botulinum toxins, it is necessary to subject the nontoxic filtrates to activation by pancreatin, and after this set up biological tests and the neutralization reaction with antibotulinum serum type E. (Author)

AD-639 413 **Field 6M**
Not available from CFSTI.
Prairie Regional Lab., Saskatoon (Saskatchewan).
LIPIDS OF CANDIDA UTILIS: CHANGES WITH GROWTH.
by P. S. S. Dawson, and B. M. Craig. 18 Oct 65, 11p
NRC-8937
Availability: Published in Canadian Journal of Microbiology v12 p775-85 1966.

Descriptors: (*Candida, Lipids), Culture media, Growth, Chromatographic analysis, Fatty acids, Amino acids, Metabolism, Canada.

Total lipids were extracted from cells of Candida utilis grown in batch, chemostat, and phased culture. Thin-layer chromatography of the extracts showed qualitative changes in the different lipid classes with growth. Gas-liquid chromatography was used to follow quantitative changes in the fatty acid constituents. Changes were found to be analogous to those previously reported for the amino acid pool, i.e., characteristic of the medium, of growth rate, and of the environment. The significance of the changes, and of the methods used to detect them, are discussed in relation to the growth and metabolism of the cell and of the culture. (Author)

AD-639 415 **Field 6M**
Not available from CFSTI.
Prairie Regional Lab., Saskatoon (Saskatchewan).
PRODUCTION OF PYOCYANINE BY PSEUDOMONAS AERUGINOSA ATCC 9027.
by J. C. MacDonald. 9 Dec 65, 4p
NRC-8974
Availability: Published in Canadian Journal of Microbiology v12 p771-4 1966.

Descriptors: (*Organic pigments, Biosynthesis), (*Pseudomonas aeroginosa, Organic pigments), Culture media, Canada.

Identifiers: Pyocyanine.

The ability of various synthetic media to support pyocyanine production by Pseudomonas aeruginosa ATCC 9027 and PRL F20 was assessed in both stationary and shaken cultures. Media which gave good pyocyanine yields with stationary cultures did not necessarily do so with shaken cultures. The production of pyocyanine by ATCC 9027 grown in shaken cultures on media containing 0.04% K2HPO4 was low, and was increased by lowering the concentration of phosphate. (Author)

AD-639 416 **Field 6M**
Not available from CFSTI.
Atlantic Regional Lab., Halifax (Nova Scotia).
GLYCOSULFATASE OF PSEUDOMONAS CARRAGEENOVORA: DESULFATION OF DISACCHARIDE FROM KAPPA-CARRAGEENAN.
by J. Weigl, and W. Yaphe. 29 Dec 65, 3p
NRC-8979
Availability: Published in Canadian Journal of Microbiology v12 p874-6 1966.

Descriptors: (*Pseudomonas, Enzymes), Disaccharides, Sulfates, Degradation, Nova Scotia.

The study indicates that the desulfation of kappa-carrageenan by P. carrageenovora occurs via an intracellular sulfatase which acts on neocarrabiose sulfate, the repeating unit of kappa-carrageenan. A point of interest is that the sulfatase acts on the disaccharide but not on the corresponding monosaccharide sulfate, galactose-4-O-sulfate. (Author)

AD-639 449 **Field 6M**
Not available from CFSTI.
Army Biological Labs., Frederick, Md. Physical Sciences Div.
EFFECTS OF OXYGEN ON AEROSOLIZED SERRATIA MARCESCENS.
by George E. Hess. 18 May 65, 8p
Availability: Published in Applied Microbiology v13 n5 p781-7 Sep 1965.

Descriptors: (*Serratia marcescens, Bacterial aerosols), (*Bacterial aerosols, Oxygen), Humidity, Viability, Dehydration.

Suspensions of Serratia marcescens (ATCC strain 14041) in water were aerosolized in a rotating drum in the oresence of various concentrations of oxygen. The colony-forming ability of aerosolized organisms was rapidly destroyed by contact with 0.25% or more oxygen at 40% relative humidity (RH) and 25 C, but was almost unimpaired for at least 5 hr in nitrogen containing not more than 10 ppm of oxygen. Completely hydrated organisms were insensitive to oxygen at pressures up to 100 psi for 4 hr. No loss in viability occurred in aerosols of washed cells in air at 97% RH. It is proposed that dehydration of the aerosolized cell results in sensitization to lethal effects of oxygen, but is not the primary cause of death. mMn (++), Co (++), glycerol, and thiourea enhanced the biological stability of aerosols in air. Numerous similarities between the effects of oxygen in this system and in systems using freeze-dried or irradiated organisms or cell-free enzymes support the hypothesis that closely related mechanisms are involved. (Author)

AD-639 450 **Field 6M**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
AGAR-GEL PRECIPITIN-INHIBITION TECHNIQUE FOR PLAGUE ANTIBODY DETERMINATIONS.
by John G. Ray Jr. and Paul J. Kadull. 16 Jun 65, 6p
Availability: Published in Applied Microbiology v13 n6 p925-30 Nov 1965.

Descriptors: (*Pasteurella pestis, Antigens + antibodies), (*Serodiagnosis, Pasteurella pestis), Vaccines, Test methods.

An application of the agar-gel precipitin-inhibition technique we described previously can be used to detect plague antibodies in human and animal sera after a series of plague vaccine inoculations or after exposure to Pasteurella pestis. Determination of the minimal reacting concentrations of the plague antigen and antibody reagents, methods for combining reagents, and length of incubation periods are discussed. (Author)

AD-639 455 **Field 6M**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
MODE OF ACTION OF AN INHIBITOR FROM AGAR ON GROWTH AND HEMAGGLUTINATION OF GROUP A ARBOVIRUSES.
by Julio I. Colon, Jane B. Idoine, Orville M. Brand, and Richard D. Costlow. 2 Apr 65, 9p
Availability: Published in Journal of Bacteriology v90 n1 Jul 65.

Descriptors: (*Group A arboviruses, Antimetabolites), (*Antimetabolites, Polysaccharides), (*Culture media, Antimetabolites), Agglutinins.

A polysaccharide obtained from agar, and having properties similar to a previously described sulfated polysaccharide, was observed to inhibit growth and hemagglutination of some group A arboviruses. The evidence presented confirms that the inhibitory activity, in part, is the result of direct interaction between the agar polysaccharide (AP) and free virus particles. Additional evidence indicates that inhibition of viral growth also occurs as the result of interaction between AP and the chick-fibroblast cells used for propagation of the virus. The possibility was considered, therefore, that at least two different inhibitors could be present in AP-one that reacts directly with the virus particle and another that reacts with host cells. AP does not induce the production of interferon in the test system used. (Author)

AD-639 456 **Field 6M**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
PASTEURELLA PESTIS: ROLE OF PESTICIN I AND IRON IN EXPERIMENTAL PLAGUE.
27 May 65, 2p
Availability: Published in Science v149 n3682 p422-4 23 Jul 1965.

Descriptors: (*Pasteurella pestis, Toxicity), (*Genetics, Pasteurella pestis), Viability, Iron, Peptide hydrolases, Plasmin, Antigens + antibodies, Mutations, Dosage, Toxins + antitoxins, Diseases.

Identifiers: Pesticins.

Loss of the genetic determinant for pesticin I in Pasteurella pestis results in concomitant loss of the plague coagulase and fibrinolytic factor. The median lethal dose for mice of an isolate lacking only these activities is increased by factors of about ten, ten thousand, and ten million cells when administered by the intravenous, intraperitoneal, and subcutaneous routes, respectively. Virulence of the aforesaid strain can be enhanced in mice treated with 40 micrograms of ferrous iron. This response resembles that of Pasteurella pseudotuberculosis, a closely related species that normally lacks pesticin I. (Author)

AD-639 457 **Field 6M**
Not available from CFSTI.
Karlonska Institutet, Stockholm (Sweden).
TOXIN PRODUCTION BY CLOSTRIDIUM TETANI IN BIPHASIC LIQUID CULTURES.
by Milton Puziss, and C.-G. Heden. 15 Mar 65, 12p
Availability: Published in Biotechnology and Bioengineering v7 n3 p355-66 1965.

Descriptors: (*Clostridium tetani, Toxins + antitoxins), (*Culture media, Polymers), (*Toxins + antitoxins, Biosynthesis), Liquids, Growth.

An exploratory study is described on the use of a biphasic culture technique for production of toxin by C. tetani. The biphasic system used was a combination of dextran and poly (ethylene glycol) (PEG) in the presence of a protein-free medium. The system supported good growth and gave a favorable phase ratio (top/bottom) of 15:1. The majority of the bacterial cells were in the bottom dextran phase, while the greater part of the toxin was in the upper PEG-medium phase. Toxin yields from a typical experiment were 10 to the 9th power mouse IP MLD/ml. of upper phase filtrate. The biphasic culture system was also adaptable to continuous culture, with approximately similar toxin levels found in the upper phase. The appearance of the clostridial cells in older cultures suggested the possibility of protoplast formation, perhaps stabilized by the polymers present. In vitro toxin titration (Lf) was inhibited by the presence of the polymers. Bacillus anthracis also grew well in the biphasic system and elaborated protective antigen, primarily into the upper phase. (Author)

AD-639 458 **Field 6M**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
CONTROL OF TISSUE REACTIONS IN MONKEYS VACCINATED WITH VIABLE COCCIDIOIDES IMMITIS BY PREVACCINATION WITH KILLED COCCIDIOIDES IMMITIS.
by J. L. Converse, G. A. Deauville, E. M. Snyder, J. G. Ray, and M. E. Seaquist. 27 Apr 65, 7p
Availability: Published in Journal of Bacteriology v90 n3 Sep 1965.

Descriptors: (*Coccidioides, Vaccines), (*Vaccines, Viability), (*Immunity, Coccidioides), Spores, Injection (Medicine), Antigens + antibodies, Diseases, Monkeys, Mortality rates.

Control of undersirable tissue reactions resulting from the subcutaneous injection of 150 viable arthrospores of Coccidioides immitis (strain D-76) was obtained by four injections of formalin-killed arthrospores 14, 12, 8 and 4 weeks (total dose, 36 mg) before injection of the viable arthrospores. Only 6 and 12% of these vaccinated animals exhibited ulceration and lymphadenopathy, respectively, as compared with 100 and 83% of the animals receiving only the viable vaccine. Agar-gel immunodiffusion precipitin titers of approximately 1:64 were evident 3 months after vaccination in animals receiving both vaccines, as compared with 1:128 in those injected with the viable vaccine alone. The above data indicated that somatic reactions to injection of a viable vaccine could be eliminated by preinjection of a killed vaccine. However, 6 months after vaccination, respiratory challenge (7,500 strain Cash arthrospores) indicated that this treatment also impaired the protective effect of the viable vaccine. All animals receiving both vaccines demonstrated a more rapid and higher postchallenge precipitin titer. All vaccinated animals (those receiving the killed, the viable, or a combination of the two vaccines) survived for 4 months after challenge, as compared with 88% mortality (50% within 14 days) in the nonvaccinated controls. (Author)

N66-24493 **Field 6M**
CFSTI Prices HC$1.00 MF$0.50
Florida State Univ., Tallahassee.
VARIATION IN MEASUREMENTS OF MICROBIAL LOADS.
by R. G. Cornell. 16 Feb 66, 11p NASA-CR-74549
Contract NGR-10-004-029
Its Tech. Rept.-2

Descriptors: Bioassay, Density, Load, Measurement, Microbe, Microbiology, *Microorganism, Model, Spacecraft, *Spacecraft contamination, *Sterilization, Tolerance, Variation.

For abstract, see S 04 13.

N66-24922 **Field 6M**
CFSTI Prices HC$7.00 MF$1.75
National Aeronautics And Space Administration, Washington, D. C.
ECOLOGICAL AND GEOGRAPHICAL VARIABILITY OF SOIL BACTERIA.
by YE. N.Mishustin. Feb 66, 312p NASA-TT-F-10124
Transl. Into English Of The Book "Ekologo-geograficheskaya Izmenchivost" Pochvennykh Bakteriy" Moscow, Izd. An Sssr, 1947

Descriptors: Bacillus, *Bacteria, Bibliography, Cell, Climate, *Ecology, Formation, *Geology, Grain, Microbe, *Microbiology, Nutrition, Seed, *Soil, Spore, U.s.s.r., Variation.

For abstract, see S 04 13.

N66-24988 **Field 6M**
CFSTI Prices HC$2.00 MF$0.50
Public Health Service, Cincinnati, Ohio.
ECOLOGY AND THERMAL INACTIVATION OF MICROBES IN AND ON INTERPLANETARY SPACE VEHICLE COMPONENTS FOURTH QUARTERLY PROGRESS REPORT, JAN. 1 MAR. 31, 1966.
by R. Angelotti. Apr 66, 26p NASA-CR-74711
NASA ORDER R-36-015-001

Descriptors: Bacillus, Component, Dry, *Dry heat, *Encapsulation, Heat, Interplanetary, *Interplanetary spacecraft, *Lucite, Microbe, Resistance, Simulation, Space, *Space simulation, Spacecraft, *Spore, Thermal.

For abstract, see S 04 13.

N66-26648 **Field 6M**
CFSTI Prices HC$2.00 MF$0.50
Oregon State Univ., Corvallis.
SYSTEMATIC DESCRIPTION OF BACTERIAL ISOLANTS FROM RIGOROUS ENVIRONMENTS. DESCRIPTIVE CHARTS OF SAHARA DESERT ISOLANTS.
by W. B. Bollen. 1 Apr 66, 47p NASA-CR-75107
Contracts NAS7-100, JPL-950783
Prepared For Jpl

Descriptors: Affinity, Bacillus, Bacteria, *Bacteriology, Classification, Culture, *Culture (biol), Desert, Environment, *Environmental index, Index, Isolation, Microbiology, *Morphology, *Physiology, Positive, Rod, Tabulation.

For abstract, see S 04 14.

N66-26657 **Field 6M**
CFSTI Prices HC$3.00 MF$0.75
Oregon State Univ., Corvallis.
MICROORGANISM STUDY PROGRESS REPORT.
by W. B. Bollen. 9 Apr 65, 68p NASA-CR-75123
Contracts NAS7-100, JPL-950783
Prepared For Jpl

Descriptors: Age, *Bacillus, *Bacteriology, Biological, *Biological cell, Cell, Classification, Culture, *Culture (biol), Desert, Environment, *Environmental index, Index, Isolation, Microbiology, *Morphology, Tabulation.

For abstract, see S 04 14.

AD-638 788 **See Field 6A**

AD-638 937 **See Field 6O**

AD-639 082 **See Field 6O**

AD-639 119 **See Field 6E**

AD-639 512 **See Field 6A**

AD-639 513 **See Field 6A**

6N. PERSONNEL SELECTION AND MAINTENANCE (MEDICAL)

N66-24987 **Field 6N**
CFSTI Prices HC$6.00 MF$1.25
Naval School Of Aviation Medicine, Pensacola, Fla.
THE THOUSAND AVIATOR STUDY - DISTRIBUTIONS AND INTERCORRELATIONS OF SELECTED VARIABLES.
by A. Graybiel, N. E. Lane, R. E. Mitchell, and A. Oberman. 1 Sep 65, 221p NASA-CR-74710
NASA ORDER R-136
Joint Rept. With Public Health Serv. And Nasa Its Monograph 12

Descriptors: Aviator, Correlation, Distribution, Effect, Frequency, Histogram, History, Human, *Human performance, Performance, Personal, *Physiological effect, Physiology, Pilot, *Pilot performance, *Psychological testing, Psychology, Statistical, *Statistical correlation, Testing, Variable.

For abstract, see S 04 13.

AD-638 811 **See Field 6P**

6O. PHARMACOLOGY

AD-638 733 **Field 6O, 6P, 6S**
CFSTI Prices: HC$1.00 MF$0.50
Civil Aeromedical Research Inst., Oklahoma City., Okla.
PROBLEMS IN AVIATION PERSONNEL: INFLUENCE OF A TRANQUILIZER ON TEMPERATURE REGULATION IN MAN.
by P. F. Iampietro, V. Fiorica, J. R. Dille, E. A. Higgins, and G. Funkhouser.May 66, 11p AM-66-14

Descriptors: (*Tranquilizers, *Body temperature), (*Aviation personnel, Tranquilizers), Environmental tests, Heat production (Biology), Aviation safety.

The effects of a tranquilizing drug of the propaediol group, meprobamate, on thermal balance of men exposed to a cold (50F, 10C), hot (110F, 43.3C), or neutral (80F, 26.7C) environment have been investigated. Results show that a single dose of meprobamate (800 mg) has no effect on temperature regulation of men resting in a neutral environment. During exposure to hot or cold environments, however, the drug groups showed impairment in thermal balance. In the cold, heat production and core temperature of the drug group were lower than the placebo group. In the heat, only moderate elevations in the core temperatures of the drug group were detected. Possible physiological mechanisms responsible for these differences are discussed. (Author)

AD-638 813 **Field 6O, 6E**
CFSTI Prices: HC$1.00 MF$0.50
School of Aerospace Medicine, Brooks AFB, Tex.
ALTERATION OF RESPONSE OF DOGS TO CEREBRAL AEROEMBOLI BY PRETREATMENT WITH PROCAINE HYDROCHLORIDE.
by Carl B. Lyle Jr, and John B. Fitzgerald. Sep 61, 6p Rept. no. 62-5

Descriptors: (*Cerebrovascular system, *Gas embolism), (*Local anesthetics, Gas embolism), Therapy.

The effect of pretreatment with intracarotid procaine hydrochloride on the consequences of intracarotid injection of air was studied in dogs. The results indicate that this pretreatment provides a protective effect. This effect is presumably due to the prevention of vascular spasm usually caused by aeroemboli. The results are indeed not conclusive with regard to the beneficial effect of intra-arterial procaine therapy in clinical cases of aeroemboli, but it would appear that, in view of the lack of deleterious effects in anesthetized subjects, its use could be considered in selected cases. Further laboratory investigation is warranted. (Author)

AD-638 933 **Field 6O, 6E**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
BOTULINUM TOXOIDS.
by Matteo A. Cardella. 1964, 18p
Availability: Published in unidentified journal 18p.

Descriptors: (*Clostridium botulinum, *Vaccines), (*Immunity, Clostridium botulinum), Toxins + antitoxins, Antigens + antibodies, Purification, Aluminum compounds, Phosphates, Resistance (Biological), Tolerances (Physiology), Humans.

Procedures were developed for preparation of purified, aluminum-phosphate-adsorbed, univalent, bivalent, and pentavalent botulinum toxoids for the immunization of man. All preparations were well tolerated and elicited satisfactory antitoxin responses in man, whether administered as a single antigen or in combination. Four separate pentavalent type ABCDE toxoids produced immune responses to each antigen in a considerable proportion of individuals following an initial series of three injections. A booster injection administered 1 year after the initial injection markedly increased the antitoxin titers, and measurable antitoxin titers were found in 86 to 100 percent of the individuals immunized. The toxoids were antigenic for mice, guinea pigs, and rabbits. In guinea pigs, the toxoids afforded a high level of resistance to challenge by toxins administered by various routes. (Author)

AD-638 937 **Field 6O, 6M, 6E**
Not available from CFSTI.
Army Biological Labs., Frederick, Md.
SUCCESSFUL TREATMENT OF RHESUS MONKEYS FOR SEPTICEMIC ANTHRAX.
by R. E. Lincoln, F. Klein, J. S. Walker, B. W. Haines, and W. I. Jones. 1965, 5p
Availability: Published in Antimicrobial Agents and Chemotherapy p759-63 1964.

Descriptors: (*Bacillus anthracis, Diseases), (*Chemotherapy, Bacillus anthracis), (*Immunity, Bacillus anthracis), Blood, Antibiotics, Immune serums, Toxins + antitoxins, Resistance (Biological), Spores, Viability, Monkeys.

For the first time, septicemic anthrax established by respiratory exposure has been successfully treated by a combination of antibiotics, antiserum, and active immunization. The treatment protocol is based on the knowledge that death in anthrax is the result of in vivo toxins. Of 25 monkeys administered these treatment combinations, 21 survived and, by active immunization, were made completely resistant to anthrax upon challenge by both the aerogenic and intraperitoneal routes with large doses of virulent spores. Of the four monkeys that died, two died from anthrax and the remaining two from complications. This treatment regimen is believed to hold great promise for application to man. (Author)

AD-639 069 **Field 6O, 6E**
Not available from CFSTI.
Naval Medical Research Unit No. 4, Great Lakes, Ill.
LIVE AND KILLED ADENOVIRUS VACCINES FOR THE PREVENTION OF ACUTE RESPIRATORY DISEASE IN RECRUITS.
Preliminary rept.
by W. E. Pierce, R. O. Peckinpaugh, W. E. Frazier, J. P. Griffin, and B. H. Greenberg. 22 Aug 66, 7p RU-66.22
NAVMED-MF022.03.07-4014
Prepared in cooperation with Univ. of Ill., Chicago, Grant PHS-43-65-1031.
Availability: Published in Antimicrobial Agents and Chemotherapy p55-8 1965.

Descriptors: (*Vaccines, *Adenoviruses), (*Respiratory diseases, Vaccines), Military personnel, Effectiveness.

A live monovalent type 4 adenovirus vaccine administered via the enteric route was tested in a recruit population which was experiencing high rates of acute respiratory disease, associated with adenovirus type 4. Killed monovalent type 4 and bivalent types 4 and 7 adenovirus vaccines were tested simultaneously. Approximately 50% reduction in hospitalized acute respiratory disease admission rates was observed in each vaccine group when compared with its control. Acute respiratory disease admissions were reduced after the 11th day postvaccination with any of the test vaccines. The vaccines had a less beneficial effect on acute respiratory diseases which did not require hospitalization. There was no evidence that the live vaccine virus caused disease in its recipients or in their contacts. (Author)

AD-639 082 **Field 6O, 6M**
Not available from CFSTI.
Walter Reed Army Inst. of Research, Washington, D. C. Dept. of Biophysics.
EFFECTS OF BETA-MERCAPTOETHYLAMINE ON GROWTH AND RADIATION SENSITIVITY OF ESCHERICHIA COLI STAIN 15TAU-BAR.
by David M. Ginsberg. 27 Dec 65, 10p
Availability: Published in Radiation Research v28 n3 p708-16 Jul 1966.

Descriptors: (*Radioprotective agents, Escherichia coli), (*Desoxyribonucleic acids, Biosynthesis), Growth, Radiation effects, Inhibition.

Identifiers: Cysteamine.

The addition of MEA to a logarithmically growing culture of Escherichia coli strain 15TAU-bar results in immediate cessation of net protein, but not DNA, synthesis. This change in growth state appears to be the sole reason for the increase in radiation resistance of the logarithmic-phase culture incubated in MEA before irradiation. Preirradiation incubation of a stationary-phase culture with MEA does not give radioprotection. Maximum protection of stationary-phase cultures was obtained by adding MEA to the culture immediately prior to beginning irradiation. Logarithmic-phase cultures can also be protected against ionizing radiation killing if MEA is present in the cell suspension only during irradiation. This protective effect is additive with protection afforded by preirradiation incubation with MEA. (Author)

AD-639 622 **Field 6O, 6P**
Not available from CFSTI.
Lund Univ. (Sweden). Dept. of Pharmacology.
SPONTANEOUS ACTIVITY AT A MAMMALIAN NEUROMUSCULAR JUNCTION IN TETRODOTOXIN.
by D. Elmqvist, and D. S. Feldman. 1964, 4p
Grants AF-EOAR-12-63, PHS-NB-02646-04
Proj. AF-9777
Task 977701
AFOSR-66-1129
Availability: Published in Acta physiol. scand v64 p475-6 1965.

Descriptors: (*Neuromuscular transmission, *Skeletal muscle relaxants), Polycyclic compounds, Toxicity, Mammals, Acetylcholine, Sodium, Electrical conductance, Electrophysiology, Sweden.

Identifiers: Tetrodotoxin.

The results indicate that although the nerve could not propagate an action potential and thus not release acetylcholine in response to stimulation, the depolarization dependent transmitter release was still unimpared in the presence of tetrodotoxin. The ability of the muscle end-plate to respond to transmitter liberated from the nerve terminals was demonstrated even though the concentration of toxin used was 1000 to 100 times greater than that necessary to block nerve and muscle conduction. The miniature end-plate potentials observed in the presence of the toxin were, as in the normal, mainly the result of an increase in the sodium conductance of the end-plate membrane. It therefore appears that the sodium conductance increase induced by the transmitter is unaffected by the toxin and does not require all the steps needed to produce the conductance increase during the action potential. It is also possible that the sodium pathways are entirely separate for chemically and electrically induced conductance changes. (Author)

AD-639 623 **Field 6O, 6P**
Not available from CFSTI.
Lund Univ. (Sweden). Dept. of Pharmacology.
NEUROMUSCULAR TRANSMISSION IN VIVO AND THE ACTIONS OF DECAMETHONIUM: A MICRO-ELECTRODE STUDY.
by D. V. Roberts, and S. Thesleff. 23 Nov 64, 10p
Grant AF-EOAR-12-63
Proj. AF-9777
Task 977701
AFOSR-66-1134
Availability: Published in Acta Anaesth Scandinav v9 p165-72 1965.

Descriptors: (*Neuromuscular transmission, *Skeletal muscle relaxants), Electrophysiology, Acetylcholine, In vivo analysis, Rats, Sweden.

Identifiers: Decamethonium.

The lateral segmental tail muscles of the rat have been used successfully for micro-electrode studies of neuromuscular transmission and the effecrs of decamethonium in vivo. The values obtained for the resting membrane potential of single muscle fibres and of miniature end-plate potential amplitude and frequency were similar to those previously obtained in other rat muscles in vitro. Decamethonium given intravenously produced end-plate depolarization, desensitization of acetylcholine receptors and, at high frequencies of nerve stimulation, a presynaptic block of impulse transmission. (Author)

PB-172 958 **Field 6O, 6T**
CFSTI Prices: HC$2.00 MF$0.50
Hazleton Labs., Falls Church, Va.
SUBACUTE ORAL ADMINISTRATION OF CYTOSINE ARABINOSIDE HYDROCHLORIDE TO MALE AND FEMALE RHESUS MONKEYS.
by Howard Feinman, Thomas W. Tusing, Elton R. Homan, and David P. Rall. 15 Aug 66, 36p
Rept. no. 192
Contract PH43-63-1168
Prepared in cooperation with Natl. Cancer Inst., Bethesda, Md.

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Hematology, Blood chemistry, Pathology, Histology, Monkeys, Behavior, Appetite, Excretion, Biopsy, Body weight, Toxic tolerances.

Identifiers: Cytosine arabinosides.

PB-172 959 **Field 6O, 6T**
CFSTI Prices: HC$2.00 MF$0.50
Hazleton Labs., Falls Church, Va.
REPEATED INTRAVENOUS ADMINISTRATION OF METHOTREXATE (MTX) AND 6-MERCAPTOPURINE (6-MP) IN DIMETHYL SULFOXIDE (DMSO) SOLUTIONS TO MALE AND FEMALE RHESUS MONKEYS.
by Howard Feinman, Thomas W. Tusing, Elton R. Homan, and David P. Rall. 12 Aug 66, 30p Rept. no. 191
Contract PH43-63-1168
Prepared in cooperation with Natl. Cancer Inst., Bethesda, Md.

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Hematology, Blood chemistry, Pathology, Histology, Monkeys, Behavior, Appetite, Excretion, Biopsy, Body weight, Toxic tolerances, Sulfoxides.

Identifiers: Dimethyl sulfoxide, Mercaptopurines, Methotrexates.

PB-172 960 **Field 6O, 6T**
CFSTI Prices: HC$4.00 MF$1.00
Pfizer (Chas.) and Co., Inc., Maywood, N. J.
TOXICOLOGIC AND PHARMACOLOGIC STUDIES WITH MITHRAMYCIN (NSC-24559).
Research rept.
by Robert E. Morrison, J. J. Oleson, Donald E. Brown, Evelyn K. Timmens, and Mary Ann Nieglos. Apr 66, 139p
Contract PH-43-64-50
Prepared in cooperation with Nat'l. Cancer Inst. and Hackensack Hosp., N. J.

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Histology, Pathology, Blood chemistry, Hematology, Biopsy, Toxic tolerances, Monkeys, Dogs.

Identifiers: Mithramycins.

PB-172 967 **Field 6O, 6T**
CFSTI Prices: HC$2.00 MF$0.50
Mason Research Inst., Worcester, Mass.
TOXICOLOGIC EVALUATION OF TENUAZONIC ACID N,N'-DIBENZYLETHYLENEDIAMINE SALT (NSC-82260). VIII. SUPPLEMENTARY STUDIES ON RATS AND DOGS.
Research rept.
by Zareh Hadidian, David A. Cooney, and Ruth Davis. 3 Jun 66, 28p
Contract PH43-65-51

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Hematology, Blood chemistry, Histology, Pathology, Toxic tolerances, Electrophoresis, Rats, Dogs.

Identifiers: Dibenzyl ethylenediamine tenuazonates.

PB-172 968 **Field 6O, 6T**
CFSTI Prices: HC$1.00 MF$0.50
Hazleton Labs., Inc., Falls Church, Va.
THE TOXICITY OF URACIL ARABINOSIDE AND ITS TRIACETATE SALT FOLLOWING ACUTE INTRAVENOUS ADMINISTRATION TO MALE RHESUS MONKEYS.
by Howard Feinman, and Thomas W. Tusing. 23 May 66, 13p Rept. no. 183
Contract PH43-63-1168

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Hematology, Blood chemistry, Biopsy, Pathology, Histology, Toxic tolerances, Behavior, Body weight, Appetite, Excretion, Monkeys.

Identifiers: Uracil arabinosides, Uracil arabinoside triacetates.

Uracil arabinoside and Uracil arabinoside triacetate, at the level of 1250 mg/kg, were administered intravenously in a single dose, to each of two male monkeys. Solutions of the compounds were prepared in dimethyl sulfoxide at a concentration of 500 mg/ml. A third male monkey served as the vehicle control and received a single intravenous does of 2.5 ml/kg of undiluted dimethyl sulfoxide, a volume equivalent to that given the two test animals. The criteria of effect evaluated were appearance and behavior, appetite and elimination, hematologic and biochemical studies, and gross and microscopic pathologic examination. The similarity in severity of the findings noted in each of the two test animals was essentially that observed in the vehicle control animal, and consisted of decreased activity, slight salivation or vomiting, blood-tinged urine, and characteristic sulfide odor to the breath, appearing within one-to-three hours following administration. At the end of the first 24 hours, the vehicle control animal, and both of the test animals, appeared normal and exhibited normal appearance and behavior throughout the 21-day observation period. The vehicle control animal lost weight, and the two test animals maintained body weight during the observation period. Results of clinical laboratory studies revealed slight alteration in the hemograms of the control and each test animal by Day 7, as evidenced by slight decrease in hematocrit and hemoglobin, and red blood cell counts. (Author)

PB-172 969 **Field 6O, 6T**
CFSTI Prices: HC$2.00 MF$0.50
Mason Research Inst., Worcester, Mass.
TOXICOLOGIC EVALUATION OF 18-NOR-4,13-ANDROSTADIEN-3-ONE,17,17-DIMETHYL (NSC-39364).
by Zareh Hadidian. 12 Jan 66, 34p
Contract PH43-65-51

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Hematology, Blood chemistry, Pathology, Histology, Body weight, Rats, Dogs, Toxic tolerances, Steroids.

Identifiers: Dimethyl norandrostadienones.

PB-172 970 **Field 6O, 6T**
CFSTI Prices: HC$1.00 MF$0.50
Hazleton Labs., Inc., Falls Church, Va.
ACUTE ORAL TOXICITY OF BCNU, CCNU, AND CFNU TO MALE ALBINO SWISS MICE AND MALE BDF1 MICE.
20 Jun 66, 15p Rept. no. 189
Grant PHS-PH43-63-1168

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Pathology, Histology, Biopsy, Toxic tolerances, Mice.

Identifiers: Bis (Chloroethyl) nitrosoureas, Cyclohexyl fluoroethyl nitrosoureas, Chloroethyl cyclohexyl nitrosoureas.

The acute toxicities of 1,3-bis (2-chloroethyl)-1-nitrosourea (molecular weight - 214.0), 1- (2-chloroethyl)-3-cyclohexyl-1-nitrosourea (molecular weight - 234.0), and 3-cyclohexyl-1- (2-fluoroethyi)-1-nitrosourea (molecular weight - 217.25) were evaulated following single oral administration to male albino Swiss mice. The LD50 found for each compound in male albino mice was administered orally to BDF1 mice to compare toxicity and lethality of the compounds in two different strains of mice. A concentration of 4.0 mg/ml of each compound was prepared as a suspension in 0.5% methylcellulosefor use in this study. The acute oral LD50's for BCNU, CCNU, and CFNU at 21 days in male albino Swiss mice were found to be 42.0, 74.5, and 80.0 mg/kg of body weight, respectively. The LD50 dose for albino Swiss mice for each compound, when administered to BDF1 mice, produced 0%, 30%, and 70% mortality for BCNU, CCNU, and CFNU, respectively. BDF1 mice were significantly less sensitive to BCNU than were the albino Swiss mice. Signs of toxicity produced by each compound were similar in both strains of mice. (Author)

PB-172 971 **Field 6O, 6T**
CFSTI Prices: HC$4.00 MF$0.75
Pfizer (Chas.) and Co., Inc., Maywood, N. J.
SUPPLEMENTARY TOXICOLOGIC AND PHARMACOLOGIC STUDIES WITH P 2292 (NSC-68626).
Research rept.
by Robert K. Morrison, J. J. Oleson, Donald E. Brown, Evelyn K. Timmens, and Mary Ann Nieglos. Apr 66, 110p
Contract PH-43-64-50

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Histology, Hematology, Blood chemistry, Toxic tolerances, Biopsy, Urine, Dogs, Monkeys, Pathology, Hydrazine derivatives.

Identifiers: Acetyl picolinoyl hydrazines.

PB-172 972 **Field 6O, 6T**
CFSTI Prices: HC$4.00 MF$0.75
South Shore Analytical and Research Lab., Inc., Islip, N. Y.
TOXICOLOGIC EVALUATION OF IMIDAZOLE-4 (OR 5)-CARBOXAMIDE, 5 (OR 4)- (DIMETHYLTRIAZENO)- (NSC-45388).
Research rept.
by Nathan Rakieten. 23 Mar 66, 121p
Contract PH-43-64-932

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Hematology, Blood chemistry, Pathology, Histology, Hemolysis, Leukemia, Bone marrow, Rabbits, Guinea pigs, Dogs, Monkeys, Mice, Toxic tolerances.

Identifiers: Dimethyltriazens imidazole carboxamides.

PB-172 973 **Field 6O, 6T**
CFSTI Prices: HC$2.00 MF$0.50
South Shore Analytical and Research Lab., Inc., Islip, N. Y.
COMPARATIVE LD50 WITH AND WITHOUT PRIMING DOSE. PRIMING DOSE STUDY, I. P. ADMINISTRATION IN BALB C MICE (NSC-45388).
Laboratory rept.
by Nathan Rakieten, David A. Cooney, and Ruth D. Davis. 13 Jul 66, 26p
Contract PH-43-64-932

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Histology, Pathology, Toxic tolerances, Mortality rates, Biopsy, Mice.

Identifiers: Dimethyltriazeno imidazole carboxamides.

PB-173 008 **Field 6O, 6T**
CFSTI Prices: HC$1.00 MF$0.50
Hazleton Labs., Inc., Falls Church, Va.
ACUTE ORAL AND PARENTERAL TOXICITY OF 1,3-BIS (2-CHLOROETHYL)-1-NITROSOUREA (BCNU), ADMINISTERED TO MALE ALBINO RATS.
by Howard Feinman, and T. W. Tusing. 31 May 66, 13p Rept. no. 184
Contract PH43-63-1168

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Pathology, Histology, Biopsy, Body weight, Mortality rates, Toxic tolerances, Rats.

Identifiers: Bis (Chloroethyl) nitrosoureas.

The acute toxicity of 1-3-bis (2-chloroethyl)-1-nitrosourea (BCNU, mol. wt. 214.07) was evaluated following single intravenous, intraperitoneal, and oral administration to male albino rats. The compound was prepared in sterile saline, at a concentration of 4 mg/ml and administered to unfasted rats by each of the routes specified. Following administration of BCNU by each route, the animals were held for extended observation periods, from seven to 15 weeks. The LD50's of BCNU following either intravenous, intraperitoneal, or oral administration, were based on the mortality data at 23 days. Following each route of administration, BCNU produced depression, labored respiration, depressed reflexes, abnormal gait, and weight loss prior to death. A slightly yellow coloration of the ears and extremities, and dark yellow urine were observed among the animals, particularly at the higher dose levels, following each route of administration. (Author)

PB-173 009 **Field 6O, 6T**
CFSTI Prices: HC$2.00 MF$0.50
Mason Research Inst., Worcester, Mass.
TOXICOLOGIC EVALUATION OF NOGALAMYCIN (NSC-70845).
Supplementary research rept.
by Zareh Hadidian. 16 May 66, 33p
Contract PH43-65-51

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Pathology, Histology, Hematology, Blood chemistry, Toxic tolerances, Biopsy, Urinary system, Mice, Dogs, Monkeys.

Identifiers: Nogalamycins.

PB-173 011 **Field 6O, 6T**
CFSTI Prices: HC$5.00 MF$1.00
Pfizer (Chas.) and Co., Maywood, N. J.
TOXICOLOGIC EVALUATION OF METHACRYLIC ACID, 2,3-EPOXY-PROPYL ESTER (NSC-67195).
Research rept.
by Robert K. Morrison, J. J. Oleson, Donald E. Brown, Evelyn K. Timmens, and Rosemary Tassini. Dec 65, 153p
Grant PHS-PH43-64-50

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Hematology, Blood chemistry, Pathology, Histology, Leukemia, Mice, Rats, Dogs, Monkeys, Toxic tolerances.

Identifiers: Epoxy propyl methacrylates.

PB-173 012 **Field 6O, 6T**
CFSTI Prices: HC$2.00 MF$0.50
Mason Research Inst., Worcester, Mass.
TOXICOLOGIC EVALUATION OF ESTRA-4,9,11-TRIEN-3-ONE, 17BETA-HYDROXY-17-METHYL- (NSC-92858E).
Research rept.
by Zareh Hadidian, David A. Cooney, and Ruth D. Davis. 31 Jan 66, 40p
Contract PH43-65-51

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Hematology, Blood chemistry, Pathology, Histology, Body weight, Rats, Dogs, Monkeys, Toxic tolerances, Steroids.

Identifiers: Hydroxy methyl estratrienones.

PB-173 013 **Field 6O, 6T**
CFSTI Prices: HC$3.00 MF$0.75
South Shore Analytical and Research Lab., Inc., Islip, N. Y.
TOXICOLOGIC EVALUATION OF STREPTOZOTOCIN (PURE) (NSC-85998).
Research rept.
by Nathan Rakieten, David A. Cooney, and Ruth D. Davis. 26 Jan 66, 97p
Contract PH43-64-932
Addendum is attached.

Descriptors: (*Cancer, Chemotherapeutic agents), (*Chemotherapeutic agents, Toxicity), Pharmacology, Dosage, Hematology, Blood chemistry, Pathology, Histology, Dogs, Monkeys, Toxic tolerances.

Identifiers: Streptozotocins.

Citric acid saline, pH 4.6, the vehicle used in the formulation of compound NSC 85998, was administered I.V. to two beagle dogs and two Rhesus monkeys for 14 days in volumes equivalent to the dosage of 4.2 mg/kg/day of NSC 85998 to beagle dogs, and 12 mg/kg/day to Rhesus monkeys. These constituted control animals. These drug dosages were the highest used in the Study on compound NSC 85998 reported on January 26, 1966. Administration of the vehicle did not result in any toxic symptoms nor any significant alterations in the hematology or blood chemistry of the dogs or monkeys. Further no significant changes were noted in the blood pH after this regimen. Gross Patholog: On post mortem examination perivenous hemorrhages were noted where recent venapunctures were done and probably were mechanical in origin rather than the result of the vehicle. No other significant findings were seen. Histopathology: The only finding that was noted in the control animals was some slight perivenous hemorrhage at the site of injections. This is probably due to trauma. (Author)

AD-639 512 **See Field 6A**

AD-639 513 **See Field 6A**

6P. PHYSIOLOGY

AD-638 711 **Field 6P**
Not available from CFSTI.
Librascope Div., General Precision, Inc., Glendale, Calif.
NEUROLECTRIC POTENTIALS DERIVED FROM AN EXTENDED VERSION OF THE HODGKIN-HUXLEY MODEL.
by E. R. Lewis. 23 Jun 65, 39p
Contract AF 49 (638)-1232
Proj. AF-9777
Task 977701
AFOSR-66-0840
Availability: Published in Journal of Theoretical Biology v10 p125-58 Jan 1966.

Descriptors: (*Nerve impulses, Electrophysiology), (*Electrophysiology, Mathematical models), Nerve cells, Membranes (Biology), Electrolytes (Physiology), Sodium, Potassium, Ions, Electrical conductance, Polarization, Equilibrium, Thresholds (Physiology), Stimulation, Equations.

Identifiers: Hodgkin-Huxley equations.

Electronic analogs based on the squid giant axon data of Hodgkin and Huxley and others have been used to simulate and study neuronal behavior. Particular emphasis has been placed on subthreshold phenomena which affect the timing of spikes. A number of oscillatory mechanisms were shown to be inherent in the squid-axon data and in the Hodgkin-Huxley model. Stability criteria were established for several oscillatory modes. Facilitatory and mutual facilitatory mechanisms were also shown to be inherent in the Hodgkin-Huxley model. Questions of electrical excitability and synaptic after effects were also considered. Comparisons were made between digital computer simulation and the electronic analog simulation; the latter was shown to be much more economical for studies of small networks. (Author)

AD-638 745 **Field 6P, 6S**
CFSTI Prices: HC$2.00 MF$0.50
Ohio State Univ., Columbus.
MEASUREMENT OF COMPLIANCE AND RESISTANCE OF THE LUNGS AND THORAX BY THE USE OF EXPIRATORY FLOW-VOLUME CURVES.
Final rept., Jul 63-Jun 65.
by William Raymond Carpenter. Apr 66, 39p
Contract AF 33 (657)-11698
Proj. AF-7222
AMRL-TR-66-12

Descriptors: (*Lungs, Mechanical properties), (*Thorax, Mechanical properties), Respiratory system, Pressure suits, Volume, Air, Meters, Respiration.

Compliance and resistance of the lungs and thorax system were measured in five healthy subjects by a method using relaxed expiratory flow-volume curves. Determinations were made during normal 'shirt-sleeve' conditions and with the subjects suited in ventilated full pressure suits and in anti-G suits inflated to 3 psi. Vital capacity, inspiratory capacity and expiratory reserve volume were also measured under the three conditions. A significant correlation was found between the volume of air inspired above Functional Residual Capacity (FRC) expressed as percentage of normal vital capacity and peak flow reached under normal conditions. No significant correlation was found between the volume of air inspired above FRC and the slope of the V - V curve. Vital capacity and expiratory reserve volume were reduced when the subjects were in pressure suits and anti-G suits, but there was no significant change in inspiratory capacity. A reduction in FRC is implied. (Author)

AD-638 746 **Field 6P**
CFSTI Prices: HC$1.00 MF$0.50
Weizmann Inst. of Science, Rehovoth (Israel).
AGGLUTINATION BY POLYLYSINE OF YOUNG AND OLD RED BLOOD CELLS.
Technical rept.
by Y. Marikovsky, D. Danon, and A. Katchalsky. Apr 66, 15p
Contract AF 61 (052)-879
Proj. AF-7164
Task 716404
AMRL-TR-66-65

Descriptors: (*Erythrocytes, Blood coagulation), Electrophoresis, Aging (Physiology), Enzymes, Static electricity, Electrophysiology, Israel.

The rate of agglutination by polylysine of young and old human erythrocytes was automatically recorded and correlated with measurements of the electrophoretic mobility of these cells. Old red cells have a reduced electrophoretic mobility as compared with young cells, as well as a higher rate of agglutination than young cells. Mild treatment of red cells with receptor destroying enzyme (RDE) which reduces their surface charge results in an increased rate of agglutination. The results indicate that there is correlation between the rate of agglutination and the surface charge of the red cell. (Author)

AD-638 770 **Field 6P, 5J**
Not available from CFSTI.
Columbia Univ., New York.
MAINTAINING AN ABSOLUTE TEST HUE IN THE PRESENCE OF DIFFERENT BACKGROUND COLORS AND LUMINANCE RATIOS.
Technical rept.
by Munehira Akita, and C. H. Graham. 21 Aug 65, 10p TR-34
Contract Nonr-266 (46)
Proj. NR-142-404
Availability: Published in Vision Res. v6 p315-23 1966.

Descriptors: (*Colors, Reliability), (*Color vision, Tests), Background, Illumination, Brightness, Analysis of variance, Psychophysiology.

Measures are made of changes in test wavelength required to compensate for a contrast effect intro-

duced by a background color. The test hue remains constant when the contrast effect is modified by a shift of the test wavelength, usually toward the direction of the background. Ratio of test-to-background luminance has an imprecisely specifiable influence on compensatory wavelength changes in the test area. Wavelength settings for similar test hues made in a dark surround at two levels of luminance, 1.1 and 12.0 mL, demonstrate a Bezold-Brucke shift due to intensity level. (Author)

AD-638 811 **Field 6P, 6N**
CFSTI Prices: HC$1.00 MF$0.50
School of Aerospace Medicine, Brooks AFB, Tex.
MEASUREMENT OF HUMAN BODY FAT: A QUANTITATIVE METHOD SUITED FOR USE BY AVIATION MEDICAL OFFICERS.
Technical documentary rept.
by Thomas H. Allen. Jun 63, 9p SAM-TDR-63-45
Proj. AF-7758
Task 775801

Descriptors: (*Obesity, Mathematical analysis), Adipose tissue, Measurement, Body weight, Lipids, Medical examination, Equations, Physical fitness.

Various volumes of the body are obtained by displacement of water in a specially constructed volumeter. From the total body tissue volume and body weight, one calculates the quantity of body fat. A comparison of two subjects illustrates points of interest in physical examinations. Although a man can be greatly overweight, as judged from height: weight tables, he is not necessarily obese due to fat. Another man can weigh only slightly more than the USAF standard and have an exceedingly large amount of body fat, actually enough to be considered obese. (Author)

AD-638 815 **Field 6P, 5J**
CFSTI Prices: HC$1.00 MF$0.50
School of Aerospace Medicine, Brooks AFB, Tex.
BACKWARD MASKING: MONOTIC AND DICHOTIC CONDITIONS.
by Lois I. Elliott. 19 Mar 62, 16p

Descriptors: (*Auditory perception, Thresholds (Physiology)), Auditory signals, Stimulation, Ear, Electrophysiology, Nervous system, Noise, Analysis of variance.

Identifiers: Masking.

'Backward masking' is the term used to denote the situation in which one auditory stimulus is masked by another auditory stimulus which follows it in time, while in 'forward masking' the temporal positions of masking and masked signals are reversed. In this study, backward and forward masking were investigated for both monotic and dichotic conditions by using white noise as the masking signal and a 1000-cps probe signal. Results indicate that monotic backward masking occurs over intervals up to 50 msec., while for the dichotic condition, backward masking occurs for intervals as long as 15 msec. Less monotic forward masking is obtained for brief masking intervals, and very little dichotic forward masking is observed. These findings are considered in relation to other experimental results. (Author)

AD-638 875 **Field 6P**
Not available from CFSTI.
Lyon Univ. (France). Institut de Physiologie.
ETUDE DES MOUVEMENTS OCULAIRES OBSERVES CHEZ L'HOMME AU COURS DE LA VEILLE ET DU SOMMELL (Study of Eye Movement in Man Observed During Wakefulness and Sleep).
by M. Jeannerod, J. Mouret, and M. Jouvet. 1962, 4p
Grant AF-EOAR-62-67
Text in French.
Availability: Published in Comptes Rendus des Seances de la Societe de Biologie v156 n8-9 p1407 1962.

Descriptors: (*Sleep, *Nystagmus), Electrophysiology, Eye, Motion, France.

Identifiers: Wakefulness.

AD-639 090 **Field 6P, 6E**
Not available from CFSTI.
Purdue Univ., Lafayette, Ind. Voice Science Lab.
STUDIES IN SPEECH RECEPTION TESTING.
by Marcella Pepper Doyne, and M. D. Steer.
1950, 9p
Contract N6ori-104- (02)
Proj. NR-782-003
SPECDEVCEN-104-2-23
Availability: Published in The Journal of Speech and Hearing Disorders v16 p132-39 Jun 1951.

Descriptors: (*Hearing, Audiometry), Speech, Auditory perception.

The purpose of these studies was to investigate the application of the Voice Communications Laboratory 24-word Test as a speech reception test of hearing ability, and to compare the results with those obtained under the same conditions for two established intelligibility tests, Auditory Test No. Nine (Spondaic Words) and the PB-50 (Phonetically Balanced) lists. Twenty-five normal-hearing subjects and 22 hard of hearing subjects were administered modified forms of the three tests, recorded by the experimenters at Purdue University, and the PB test recorded at Central Institute for the Deaf. The tests were administered in five db steps, through the Purdue Speech Reception Test Equipment. The reliability coefficients for the four tests, computed by the odd-even method, all were above .93. The mean percentage scores and standard deviations of the normal-hearing subjects were computed for the tests at each intensity level and the relationship between scores and intensity were plotted on a graph. Results of the tests for both the normal hearing and hard of hearing groups were then subjected to statistical analysis. (Author)

AD-639 117 **Field 6P**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
A NEW TEST OF SCOTOPIC SENSITIVITY.
by Jo Ann Smith Kinney, Edward J. Sweeney, and Alma P. Ryan. 1960, 7p Rept. no. 342
Availability: Published in The American Journal of Psychology v73 n3 p461-7 Sep 1960.

Descriptors: (*Vision, Adaptation (Physiology)), Photosensitivity (Biological), Diurnal variations, Retina, Test equipment, Portable, Ophthalmology.

A new test of scotopic sensitivity was developed. The test and its portable apparatus are easily reproduced and given. As a testing device, it employs principles which show promise of reliably differentiating Ss according to their sensitivity in night vision. These include measures of sensitivity at numerous locations in the visual field, presenting two stimuli on each trial, and using different sized stimuli from which a total score is compiled. This test has been used to examine 30 naval enlisted men. The scores show large individual differences and have a test-retest reliability of 0.89. The results were very similar to those obtained from 108 Ss who were tested with a preliminary model. The questions of the meaning of the individual differences and of the external validity of the test are discussed. (Author)

AD-639 120 **Field 6P**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
EFFECT OF RED VS WHITE ADAPTATION AND TARGET ILLUMINATION ON THE TEMPORAL COURSE OF SCOTOPIC ACUITY.
by S. M. Luria, and Ira Schwartz. 24 Nov 59, 6p Rept. no. 343
Availability: Published in Journal of the Optical Society of America v50 n11 p1075-80 Nov 1960.

Descriptors: (*Vision, Adaptation (Physiology)), (*Visual acuity, Colors), Targets, Illumination, Photosensitivity (Biological), Ophthalmology.

Curves are presented showing the times required for three observers to resolve a series of high contrast targets after initial adaptation to red or white light of 3.4 ft-L when the target luminances were 3.22, 3.82, 4.17, 4.77, and 5.13 log micromicron L. The resolution times were also measured as a function of three levels of red and white initial adaptation, 22, 3.4, and 0.19 ft-L, while the target luminance was held constant at 4.17 log micromicron L. In addition, a few measurements were made on low contrast targets at this last luminance. The curves generally conform with previous determinations, rising steeply at first and reaching an asymptote within ten minutes. They are sharply divided into two distinct groups, depending on the color of the initial adapting light, red interfering less with the subsequent rise in acuity than white. The results indicate that the savings in time effected by the use of red rather than an equated white initial adapting light are not a function of the target illumination but remain approximately constant throughout the range of pure scotopic brightness at about 3 min. This decreased to about 2 min when the target luminance entered the mesopic range. Previous findings concerning the relation between target contrast and acuity, and that time savings with the use of red increase as the preadapting luminance increases, were confirmed. (Author)

AD-639 122 **Field 6P**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
EFFECT OF DIFFERENTIAL BINOCULAR ADAPTATION ON SCOTOPIC ACUITY.
by S. M. Luria, and Ira Schwartz. 23 Sep 59, 3p
Rept. no. 337
Availability: Published in Journal of the Optical Society of America v50 n3 p251-3 Mar 1960.

Descriptors: (*Visual acuity, Adaptation (Physiology)), Thresholds (Physiology), Vision, Reflexes, Eye, Visual signals, Ophthalmology.

Monocular scotopic acuity thresholds were determined for three observers when both eyes were dark adapted and also when only the observing eye was dark adapted while the nonobserving eye was exposed to a brightness of 100 ft-L between the target presentations. Although the observers reported that the targets looked quite different under the two conditions, acuity remained substantially the same under both conditions, and it was concluded that light adapting one eye does not affect the scotopic acuity of the other eye. (Author)

AD-639 123 **Field 6P**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
SEASONAL CHANGES IN SCOTOPIC SENSITIVITY.
by Edward J. Sweeney, Jo Ann S. Kinney, and Alma Ryan. 10 Aug 59, 4p Rept. no. 338
Availability: Published in Journal of the Optical Society of America v50 n3 p237-40 Mar 1960.

Descriptors: (*Vision, Adaptation (Physiology)), (*Visual acuity, Periodic variations), Photosensitivity (Biological), Ophthalmology.

The scotopic sensitivity of three subjects was tested weekly over the course of a year. In addition, two measures were made to indicate each subject's amount of exposure to sunlight. Scotopic sensitivity was found to be poorest in the summer months, when exposure to sunlight was greatest, and to increase gradually during the fall and winter. The course of sensitivity over the year agreed well with

the external measures of exposure to sunlight, the best single measure being the amount of 'blue' light reflected by the skin. (Author)

AD-639 124 **Field 6P**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
REFRACTIVE ERROR AND THE GREEN/RED RATIO.
by Richard E. Wienke. 18 Mar 59, 2p Rept. no. 341
Availability: Published in Journal of the Optical Society of America v50 n4 p341-2 Apr 1960.

Descriptors: (*Color vision, *Refraction), Eye, Visual acuity, Rayleigh scattering, Ophthalmology.

Studies utilizing the Rayleigh equation have indicated that color normal subjects may use widely varying proportions of red and green to match a standard yellow. Six subjects with known refractive errors and with normal color vision made a series of red-green matches to a standard amount of the yellow stimulus. The green/red ratios were plotted against equivalent spherical error in diopters, and it was found that the refractive error can be used to make reasonably good predictions of the green/red ratio. (Author)

AD-639 125 **Field 6P, 5J**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
THE IMPORTANCE OF HEARING AT 3 KC FOR UNDERSTANDING SPEEDED SPEECH.
by J. Donald Harris, H. L. Haines, and C. K. Myers. 1960, 15p Rept. no. 339
Availability: Published in The Laryngoscope v70 n2 p131-46 Feb 1960.

Descriptors: (*Speech, Intelligibility), Hearing, Audiometry, Psychoacoustics, Test methods, Vocabulary, Audiofrequency.

AD-639 134 **Field 6P**
Not available from CFSTI.
Naval Medical Research Lab., New London, Conn.
CASE OF CONGENITAL TRITANOPIA WITH IMPLICATIONS FOR A TRICHROMATIC MODEL OF COLOR RECEPTION.
by Harry G. Sperling. 23 Jun 59, 8p Rept. no. 336
Availability: Published in Journal of the Optical Society of America v50 n2 p156-63 Feb 1960.

Descriptors: (*Color vision, Anomalies), Pathology, Colors, Spectra (Visible + ultraviolet), Ophthalmology.

A congenital tritanope's luminous efficiency function, dichromatic coefficients, spectral color matches, and matches to four Munsell pigment colors were obtained and compared with the results of Wright's study. The subject's luminous efficiency function fell close to the top of the range of Wright's seven tritanopes, actually falling higher in the violet-blue than average data on normals, indicating no reliable deviation from normal luminosity. The color confusions of the tritanope were studied in two ways: by obtaining metameric matches to violet with mixtures of red and blue light (dichromatic coefficients) and by finding spectral lights from the green-yellow-orange regions which matched wavelengths in the violet. The results provided two independent determinations of the locus of origin of the confusion lines, which agreed well and very closely confirmed Thomson and Wright's point. The location of a well determined confusion point for tritanopia, very close to the violet spectrum locus, further supports Thomson and Wright's conclusion that tritanopia involves the loss of a 'blue' receptor. (Author)

AD-639 150 **Field 6P**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
CONDITIONED REFLEXES TO TASTE STIMULI IN CHILDREN DURING FIRST MONTHS OF LIFE.
by Ts. P. Nemanova. 13 Jun 66, 15p FTD-TT-1995
TT-66-62281
Unedited rough draft trans. of Fiziologicheskii Zhurnal SSSR v30 n4 p478-83 1941.

Descriptors: (*Conditioned reflex, Aging (Physiology)), (*Taste, Children), Stimulation, Chemoreceptors, USSR.

The work is the continuation of a series of investigations directed toward the establishing of an age limit for the appearance of conditioned reflexes in a person. In the experiments described one was successful in establishing at what age there appear conditioned reflexes to taste stimuli and clearing up in some degree the limit of the analysis by a young child of the basic taste stimuli-sweet, sour, and salty. (Author)

AD-639 320 **Field 6P, 8A**
Not available from CFSTI.
Centre National de la Recherche Scientifique, Paris (France).
INTERACTIONS ENTRE ONDE LENTE DU POTENTIEL DE LA MEMBRANE NEURONIQUE ET POTENTIELS POST-SYNAPTIQUES D'EXCITATION (NEURONE 'BRANCHIAL' d'APLYSIA) (Interactions Between the Slow Wave of Neurona! Membrane Potential and Post-Synaptic Excitatory Potential in the 'Branchial' Neuron of Aplysia).
by A. Arvanitaki, and N. Chalazonitis. 1965, 12p
Grant AF-EOAR-114-63, PHS-NB-0337
Proj. AF-9777
Task 977701
AFOSR-66-0753
Text in French.
Availability: Published in Comptes rendus des seances de la Societe de Biologie v159 n8-9 1783-92 1965.

Descriptors: (*Nervous system, *Gastropoda), Electrophysiology, Nerve cells, Ganglia, Physiology, France.

Identifiers: Aplysia.

AD-639 321 **Field 6P, 8A**
Not available from CFSTI.
Centre National de la Recherche Scientifique, Paris (France).
THE EFFECTS OF pO2 CHANGES ON NEURONAL SYNAPTIC AND ANTIDROMIC EXCITABILITY (GIANT NEURONS OF APLYSIA FASCIATA).
by Gabriel G. Nahas, Robert B. Cook, and Nicolas Chalazonitis. 10 Jun 64, 12p
Grants AF-EOAR-114-63, PHS-NB-03337
Proj. AF-9777
Task 977701
AFOSR-66-0745
Prepared in cooperation with Columbia Univ., New York. Coll. of Physicians and Surgeons.
Availability: Published in Bull. Inst. Oceanogr. v65 n1358 p3-10 1965.

Descriptors: (*Nervous system, *Gastropoda), Oxygen, Carbon dioxide, Hypoxia, Sea water, Nerve cells, Nerve impulses, Electrophysiology.

Identifiers: Aplysia.

Effect of altering pO2 from 20 to 600 mm Hg on neuronal excitability of Aplysia fasciata was studied. Changes in membrane potential and EPSP are most marked at 25 mm Hg pO2 which represents the actual physiological level in the living animal. Therefore, the level of pO2 should be considered in any study of neuronal excitability as twell as he level of pCO2. (Author)

AD-639 324 **Field 6P, 8A**
Not available from CFSTI.
Centre National de la Recherche Scientifique Paris (France).
LES OSCILLATIONS DE BASSE FREQUENCE DU POTENTIEL DE MEMBRANE SOMATIQUE (NEURONE D'APLYSIA) (Low Frequency Oscillations of the Membrane Potential in Aplysia Neurons).
by A. Arvanitaki, and N. Chalazonitis. 1965, 15p
Grant AF-EOAR-114-63
Proj. AF-9777
Task 977701
AFOSR-66-0750
Prepared in cooperation with PHS Grant PHS-NB-03337. Text in French.
Availability: Published in Comptes Rendus des Seances de la Societe de Biologie v159 n5 p1179-90 April 27 1965.

Descriptors: (*Nervous system, *Gastropoda), Electrophysiology, Nerve cells, Nerve impulses, Physiology, France.

Identifiers: Aplysia.

AD-639 353 **Field 6P**
CFSTI Prices: HC$1.00 MF$0.50
Psychophysics Lab., Univ. of Washington, Seattle.
THE INFLUENCE OF BORDERS ON INCREMENT THRESHOLDS.
by Davida Y. Teller. 1965, 16p PLR-17A
Contract DA-49-193-MD-2713

Descriptors: (*Vision, Thresholds (Physiology)), Adaptation (Physiology), Retina, Inhibition, Nerve cells, Intensity, Light transmission, Intensity, Optical images, Chemoreceptors, Nystagmus, Ophthalmology.

Previous investigators have reported that increment thresholds are elevated in the regions of abrupt spatial changes of adapting field intensity, known as borders or edges. Such effects have often been attributed to lateral physiological interactions, particularly lateral inhibition, within the visual system. An attempt was made to determine empirically the actual cause or causes of the elevated thresholds on the high intensity side of a border. These elevated thresholds are tentatively attributed to the combined influence of two factors: involuntary eye movements, which produce frequent changes of retinal illuminance near the border; and transient elevations in the increment threshold which occur near the times of large, rapid changes in retinal illuminance. It is concluded that short-term lateral interactions have little if any influence on increment thresholds on the high intensity side of a border. The possibility remains, however, that such increment thresholds may be influenced by lateral interactions whose effects take an extended period of time to develop. (Author)

AD-639 426 **Field 6P**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
COMPLEX METHOD OF STUDYING THE FUNCTIONS OF MAN'S TASTE ANALYZER.
by A. I. Vasilev. 17 Jun 66, 20p FTD-TT-65-1915
TT-66-62331
Unedited rough draft trans. of Akademiya Nauk SSSR. Institut Fiziologii. Trudy. v6 p172-82 1957.

Descriptors: (*Taste, Physiology), (*Saliva, Secretion), Salivary glands, Stimulation, Reflexes, Electroencephalography, Mastication, Sensation (Physiology), Test equipment, Test methods, USSR.

AD-639 516 **Field 6P**
Not available from CFSTI.
Lyon Univ. (France). Laboratoire de Pathologie Experimentale.

THE EFFECTS OF CHRONIC BRAIN-STEM LESIONS ON CORTICAL AND MUSCULAR ACTIVITY DURING SLEEP AND WAKING IN THE CAT.
by J. Allan Hobson. 27 Nov 64, 24p
Grant AF-EOAR-62-67
Proj. AF-9777
Task 977701
AFOSR-66-1113
Availability: Published in Electroencephalography and Clinical Neurophysiology v19 p41-62 1965.

Descriptors: (*Sleep, Electrophysiology), (*Electroencephalography, Sleep), Brain, Muscles, Nystagmus, Cerebral cortex, Thalamus, Nerve impulses, Obstruction (Physiology), Thresholds (Physiology), Inhibition, Cats, France.

Identifiers: Electromyography, Wakefulness.

The effects of total sections and lesions of the brain-stem on some aspects of cortical and muscular activity in relation to sleep and waking were studied chronically in cats. The periodic muscular atonia of sleep is progressively inhibited as lesions are placed more caudally in the ponto-mesencephalic brain-stem. The pontine reticular formation is necessary and sufficient for its occurrence. Cortical desynchronization and waking are inhibited as lesions are placed more rostrally in the infrathalamic brain-stem, while desynchronized sleep appears normally. The posterior hypothalamus plays a particularly important role in the desynchronization of waking and the pontine brain-stem in the desynchronization of sleep, but their final common path may be the same. The coordination of tonic cortical and muscular activity, especially as manifested in desynchronized sleep, is disrupted by any total section and unaffected by any partial lesion of the brain-stem. The nervous structures involved are thus diffusely distributed in the ponto-mesencephalic brain-stem. The phasic electrical activity of desynchronized sleep disappears from structures anterior to the midbrain after any lesion of the dorsal pons or mesencephalon. Such activity may be related to the difference in pattern of firing of brain-stem and cortical units that distinguishes desynchronized sleep and waking and underlies the difference in arousal thresholds between these two states by the mechanism of occlusion. (Author)

AD-639 522 **Field 6P**
Not available from CFSTI.
Genoa Univ. (Italy). Clinica Neurochirurgica.
SOME ASPECTS OF THE FUNCTIONAL ORGANIZATION OF THE BRAIN STEM: NEUROPHYSIOLOGICAL AND NEUROSURGICAL OBSERVATIONS.
by G. F. Rossi. 1965. 8p
Grant AF-EOAR-11-64
Proj. AF-9777
Task 977701
AFOSR-66-1141
Availability: Published in Excerpta Medica International Congress ser93 p117-22 1965.

Descriptors: (*Brain, Physiology), Nervous system, Surgery, Neurology, Sleep, Nerve cells, Anatomy, Electrophysiology, Animals, Humans, Italy.

Identifiers: Wakefulness.

The aims of the present report are (1) to describe the brain stem mechanisms underlying changes of consciousness as revealed by results of animal experiments; (2) to analyze whether and to what extent similar mechanisms are at work in man. The report is based largely on personal work in neurophysiological and neurosurgical fields; because of limitations of space it contains only a synthetic account of the most relevant findings. (Author)

AD-639 524 **Field 6P**
Not available from CFSTI.
Lund Univ. (Sweden). Dept. of Histology.
ADRENERGIC NEURONS IN THE RETINA.
by Berndt Ehinger. 4 Nov 65, 6p
Grants AF-EOAR-5-64, PHS-NB-05236-01
Proj. AF-9777
Task 977701
AFOSR-66-1136
Availability: Published in Life Sciences v5 p129-31 1966.

Descriptors: (*Retina, *Autonomic nervous system), Nerve cells, Histology, Fluorescence, Vision, Adaptation (Physiology), Morphology (Biology), Ganglia, Nerve fibers, Sweden.

AD-639 525 **Field 6P**
Not available from CFSTI.
Lund Univ. (Sweden). Dept. of Histology.
NORADRENALINE AND CHOLINESTERASES IN CONCOMITANT NERVE FIBRES IN THE RAT IRIS.
by Berndt Ehinger, and Bengt Falck. 26 Aug 65, 7p
Grants AF-EOAR-5-64, PHS-NB-05236-01
Proj. AF-9777
Task 977701
AFOSR-66-1135
Availability: Published in Life Sciences v4 p2097-2100 1965.

Descriptors: (*Autonomic nervous system, *Eye), Levarterenol, Cholinesterase, Nerve cells, Nerve fibers, Morphology (Biology), Fluorescence, Histology, Rats, Sweden.

Burn and Rand have suggested that the sympathetic nervous system operates by way of a cholinergic link in the liberation of nervous catecholamines (CA). The direct histochemical demonstration of high concentrations of CA in the terminal sympathetic neurons which can be liberated upon the stimulation of the sympathetic nerves and the rapid disappearance of noradrenaline in the tissues after sympathetic denervation demonstrate that the sympathetic nerve endings are the principal peripheral store of CA. Recently, Leaders advanced the hypothesis that there may be local peripheral interaction between adrenergic and cholinergic neurons. The arguments brought forward for this as well as the Burn and Rand hypotheses are however mainly circumstantial only. In order to obtain direct morphological evidence relevant to the two hypotheses, a combination of the fluorescence method of Falck and Hillarp for the demonstration of CA and the cholinesterase technique of Koelle has been worked out on whole mounts of the rat iris. (Author)

AD-639 538 **Field 6P**
Not available from CFSTI.
Karolinska Institutet, Stockholm (Sweden). Dept. of Physiology.
ON THE OCCURRENCE OF TYRAMINE IN THE RABBIT BRAIN.
by Lars-M. Gunne, and John Jonsson. 29 Dec 64, 8p
Grant AF-EOAR-31-64
Proj. AF-9777
Task 977701
AFOSR-66-1125
Availability: Published in Acta Physiol. scand. v64 p434-8 1965.

Descriptors: (*Amines, Brain), Chromatographic analysis, Metabolism, Levarterenol, Rabbits, Sweden.

Identifiers: Tyramine.

After chromatographic separation on a strong cation exchange resin no tyramine could be detected in an extract of 6 pooled rabbit brains. This indicates that the whole brain content of tyramine must be below 10 ng/g wet tissue weight. This observation does not support the concept that tyramine should be an important metabolic precursor of noradrenaline in the brain. (Author)

AD-639 539 **Field 6P**
Not available from CFSTI.
Siena Univ. (Italy). Istituto di Patologia Medica.
PERMANENZA DEL RITMO TETA IPPOCAMPICO DURANTE IL SONNO PROFONDO DEL GATTO, DOPO LESIONI DEL SISTEMA MESENCEFALO-LIMBICO (Persistence of the Hippocampal Theta Rhythm During Deep Sleep in the Cat Following Lesions of the Mesencephalic-Limbic System).
by G. Carli, and A. Zanchetti. 10 Oct 64, 5p
Grant AF-EOAR-41-64
Proj. AF-9777
Task 977701
AFOSR-66-1104
Text in Italian.
Availability: Published in Bollettino della Societa Italiana di Biologia Sperimentale v40 n24 p2162-3 1965.

Descriptors: (*Sleep, *Electroencephalography), Brain, Nerve impulses, Electrophysiology, Cats, Italy.

It has been stated by other investigators that the characteristic theta waves present in th hippocampus of cats during deep sleep are evoked by electrical impulses ascending the mesencephalic-limbic pathways. After making extensive lesions in these pathways, the authors hstill found a clear theta rhytm in the hippocampus. They conclude that the hippocampal theta activity is caused by impulses arriving at least partially by other than mesencephalic-limbic tracts. (Author)

N66-24714 **Field 6P, 6A**
CFSTI Prices HC$3.00 MF$0.50
Goteborg Univ. (Sweden).
RESEARCH ON INTRA NEURONAL MECHANISMS FOR INFORMATION STORAGE TECHNICAL REPORT NO. 1.
by H. Hyden. 31 Mar 65, 52p AFOSR-66-0364, AD-628899
Contract AF-EOAR-63-28

Descriptors: Acid, Animal, *Animal study, Behavior, *Biochemistry, Brain, Deoxy, Disease, Enzyme, *Histology, *Learning, Level, Nervous, *Neuron, Paralysis, Physiology, Protein, Rat, Ribonucleic, *Ribonucleic acid, Study, System.

For abstract, see S 04 13.

N66-24920 **Field 6P**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Washington, D. C.
ON THE CONSTRUCTION OF A MATHEMATICAL MODEL OF A "BIOLOGICAL CLOCK"
K Postroyeniyu Matematicheskoy Modeli "Biologicheskikh Chasov"
by L. YA.Fukshanskiy, B. S. Moshkov, and G. I. Yuzefovich. Apr 66, 12p NASA-TT-F-10107
Transl. Into English From Dokl. Akad. Nauk Sssr (Moscow), V. 167, No. 2, 1966 P 440-443

Descriptors: Biology, Circadian, *Clock, Damping, Diurnal, Diurnal rhythm, *Illumination, Infrared, Light, *Mathematical model, Mathematics, Model, Rhythm, Time, Tissue, U.s.s.r..

For abstract, see S 04 13.

N66-24923 **Field 6P**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Washington, D. C.
CONTRIBUTIONS TO THE PHYSIOLOGY OF WATER AND SODIUM CHLORIDE.
Beitrage Zur Physiologie Des Wassers Und Des Kochsalzes
by O. Cohnheim, and G. Kreglinger. May 66, 26p NASA-TT-F-10131
Transl. Into English From Z. Physiol. Chem. (West Berlin), V. 63, 1910 P 413-431

Descriptors: Acid, Body, Chloride, Gastric, High altitude, Human, *Human body, Hydrochloric, Juice, Low altitude, *Metabolism, *Physiology, Sodium, *Sodium chloride, Sweat, U.s.s.r., *Water.

For abstract, see S 04 13.

N66-26053 Field 6P
CFSTI Prices HC$1.00 MF$0.50
Argentina. Comision Nacional De Energia Atomica, Buenos Aires.
DETERMINATION OF THE TOTAL BODY WATER BY MEANS OF TRITIUM WATER.
Determinacion Del Agua Total Corporal Mediante El Agua Tritiada
by O. Degrossi, H. Gotta, and M. A. Mendez.
1965, 19p CNEA-165
In Spanish, English Summary

Descriptors: Body, *Body fluid, Content, Fluid, Human, Isotope, Measurement, Radioactivity, Total, Tracer, *Tritium, Water, *Water content, Weight.

For abstract, see S 04 14.

N66-34186 Field 6P
CFSTI Prices HC$2.00 MF$0.50
California Univ., Los Angeles.
HETEROSENSORY AND HETEROCORTICAL ACTIVATION OF THE PURKINJE NEUTRON.
by C. Batini. 1966, 42p NASA-CR-77244
Grant NSG-237

Descriptors: Afferent, Bioelectric, *Bioelectric potential, Brain, Central, *Central nervous system, *Cerebellum, Climbing, Convergence, Cortex, Fiber, Moss, Nervous, *Neuron, *Physiology, Potential, Stimulus, System.

For abstract, see S 04 20.

N66-34664 Field 6P
CFSTI Prices HC$2.00 MF$0.50
Maryland Univ., College Park.
A STUDY OF PHYCOPHYSIOLOGY IN CONTROLLED ENVIRONMENTS TWELFTH SEMI-ANNUAL STATUS REPORT, 1 OCT. 1965 - 31 MAR. 1966.
by R. W. Krauss. 1 Apr 66, 40p NASA-CR-77217
Grant NSG-70-60
Its Tech. Rept.-1012

Descriptors: Algae, *Chlorella, Composition, Effect, Exploration, Gas, Growth, Intensity, Life, *Life support system, Light, Mixture, Mutation, Organic, *Physiology, Space, Species, Support, System, Unicellular.

For abstract, see S 04 20.

AD-638 718 See Field 5J

AD-638 733 See Field 6O

AD-638 769 See Field 5J

AD-638 792 See Field 6S

AD-638 990 See Field 6A

AD-639 045 See Field 5J

AD-639 109 See Field 5J

AD-639 172 See Field 14B

AD-639 370 See Field 14B

AD-639 622 See Field 6O

AD-639 623 See Field 6O

6Q. PROTECTIVE EQUIPMENT

AD-639 170 Field 6Q
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
COLD WEATHER FACIAL PROTECTION DEVICE FOR ANTARCTIC PERSONNEL.
Memo rept.
by Arne G. Neilsen, and Max Perlitsh. 14 Jul 61, 12p MR-61-6
NAVMED-MR005.12-5220-2

Descriptors: (*Protective masks, Cold weather tests), Respiration, Heat production (Biology), Moisture, Temperature, Eyeglasses, Antarctic regions.

A review of Antarctic facial protection problems is presented and a prototype face mask described which has enabled the wearer to be comfortable for one hour in a cold test chamber at -70F., as against extreme discomfort experienced after three minutes under identical conditions but without the mask. The mask is lightweight and provides protection for the face, eyes, oral structures, and the respiratory tree. It has no external power source, but relies entirely on re-cycling of natural body energy (heat and moisture). With the mask in place, the temperature of the inhaled air measured on the labial surface of the central incisors was 60F. Without mask protection, temperatures measured under identical conditions were as low as 32F. The eye protective feature remained fog-free for the one hour period. Ice accumulation within the mask was not a problem during the test period. Provision has been made for protection against snow blindness.

AD-639 173 Field 6Q
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
FIELD EVALUATION OF EXPERIMENTAL MODEL OF SUBMARINE DECK EXPOSURE SUIT.
Memo. rept.
4 May 60, 6p MR-60-8
NAVMED-NM005.14-0001.01.02

Descriptors: (*Exposure suits, Submarine personnel), Acceptability, Moistureproofing, Thermal insulation.

An improved prototype model of a waterproof submarine deck exposure suit was tested under actual operating conditions aboard a conventional-type submarine, (not a nuclear powered submarine), to determine whether it is sufficiently improved to recommend its adoption as a replacement for the present standard garment. It was concluded that in comparison with the standard wet/cold weather suit now supplied to the Fleet, the experimental submarine deck exposure suit is not sufficiently improved to warrant its being recommended as a replacement.

AD-639 179 Field 6Q
CFSTI Prices: HC$1.60 MF$0.50
Naval Medical Research Lab., New London, Conn.
FIELD TESTING OF FACIAL PROTECTIVE DEVICE IN ANTARCTICA.
Memo rept.
by Arne G. Neilsen, Max J. Perlitsh, and Thomas M. Allenworth. 24 Apr 63, 13p MR-63-6
NAVMED-MR005.12-5220-2.14

Descriptors: (*Protective masks, Cold weather tests), Antarctic regions, Eyeglasses, Respiration, Meteorological parameters.

Face masks were tested under field conditions at Pole Station, McMurdo, Byrd Station, and Hallett Station. Weather conditions varied from temperatures of +4F, 30 knots wind, daylight but cloudy to -75F, 17 knots wind and night. The face mask keeps the wearer's face warm and will provide protection to the eyes from cold and glare. Observers comments are as follows: (1) Limited field of vision. (2) Inability to wear glasses with mask. (3) Excessive resistance to breathing. (4) Collection of condensation and/or mucus on face side of mask with the subsequent leakage of these fluids from lower edge of mask and freezing or running down neck. (5) Mask makes communication (speaking or hearing) difficult. (6) Proper and comfortable fit of mask to all wearers is difficult. (7) Having a beard reduces the efficiency of the mask, but two of observers that had no beards reported lower part of the mandible getting cold. (8) Inability to wear some types of issue hats/caps with the mask. (Author)

N66-35287 Field 6Q
CFSTI Prices HC$2.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
PROTECTION AGAINST X-RAYS FROM APPARATUS FOR MEDICAL USE.
La Protezione Dalle Radiazioni Negli Impianti A Raggi X Per Uso Medico
by G. Missoni. 20 Apr 66, 42p ISS-66/16
In Italian, English Summary

Descriptors: Diagnosis, Equipment, Hazard, Irradiation, *Legal liability, Medical, *Medical equipment, Protection, *Radiation protection, Safety, *Safety hazard, Therapy, X-ray, *X-ray irradiation.

For abstract, see S 04 20.

6R. RADIOBIOLOGY

AD-639 192 Field 6R
CFSTI Prices: HC$3.00 MF$0.50
Southwest Research Inst., San Antonio, Tex. Dept. of Physical and Biological Sciences.
THE EFFECTS OF IONIZING RADIATION ON OXIDATION STATES OF BIOLOGICAL SYSTEMS.
Final rept., Jul 65-Jul 66.
by Donald E. Johnson, James W. Register Jr, William H. Storey Jr, and James N. Bollinger. 31 Jul 66, 54p
Contract AF 41 (609)-2816
Proj. SivRI-05-1755

Descriptors: (*Radiobiology, Oxidation), (*Electron spin resonance, Mitochondria), Radiation effects, Enzymes, Cytochrome oxidase, Oxidoreductases, Molybdenum, Iron, Oxidation-reduction reactions, Mice.

Changes in the oxidation state of biological systems as a function of ionizing radiation were studied by measuring the activity of two metalloenzymes and by evaluating electron spin resonance signals produced by mitochondria. The specific activity of liver cytochrome oxidase and xanthine oxidase was not altered in mice exposed to total-body irradiation of 150 to 22,500 rad. Iron (Fe (II)), molybdenum (Mo (V)), and free radicals (probably flavoquinones) yielded the most predominant signals in electron spin resonance analysis of liver mitochondria isolated from both irradiated and control mice. Both the electron spin resonance and cytochrome oxidase data suggest that the electron transport system is not damaged by the levels of ionizing radiation used in this investigation. The fact that molybdenum electron spin resonance signals occur in the mitochondrial preparations and that preliminary data indicate this metal undergoes oxidative changes due to radiation indicates the need for more extensive investigation of the relationship between this metal and ionizing radiation. (Author)

AD-639 299 Field 6R
CFSTI Prices: HC$1.00 MF$0.50
Naval Radiological Defense Lab., San Francisco, Calif.
THE SEQUESTRATION OF ERYTHROCYTES IN IRRADIATED DOGS.
by John C. Harbert, and Norbert P. Page. 29 Jul 66, 26p USNRDL-TR-1051
NAVMED-MR005.08-0017

Descriptors: (*Erythrocytes, Radiation effects), (*Reticulo-endothelial system, *Radiation effects), Xrays, Labeled substances, Radioactive isotopes, Iron, Hemopoietic system, Blood plasma, Dogs.

Fifteen dogs received 200 R of X-ray exposure. Twenty-four hours following irradiation they were injected with both free Fe55 and Fe59- labeled red cells which had been heat damaged. Fe55 measurements indicated a significantly decreased plasma clearance and red cell incorporation of iron indicating decreased erythropoiesis as a result of X-ray exposure. Sequestration of heat damaged red cells by the reticulo-endothelial system was decreased in the irradiated dogs compared to non-irradiated controls. The explanation given is that at relatively low exposures to irradiation, endogenous cellular debris imposes a blockade of the RES so that only small amounts of injected particles produce a noticeable delay in clearance. No difference in plasma iron turnover could be detected between irradiated and control dogs. It is suggested that iron turnover is an unreliable measure of erythropoiesis. (Author)

AD-639 447 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Naval Radiological Defense Lab., San Francisco, Calif.
SUPPRESSION OF HEMOPOIETIC COLONY-FORMING UNITS IN MICE BY GRAFT-VERSUS-HOST REACTIONS.
by William E. Davis Jr. and Leonard J. Cole. 22 Aug 66, 22p USNRDL-TR-1062

Descriptors: (*Transplantation, Radiation effects), (*Bone marrow, Transplantation), (*Radiation effects, Immunity), Lymphocytes, Hemopoietic system, Antigens + antibodies, Sublethal dosage, Cells (Biology), Spleen, X rays, Mice.

Attempts to characterize the time course of parental-versus-F1 hybrid immunological reactions in sublethally irradiated mice have resulted in the following observations: (1) It was possible to reverse the lethal effect of the reaction by means of a second dose of X rays delivered up to 4 days after injection of the parental lymphoid cells. In contrast, mice irradiated 5 days or later succumbed to the disease. (2) Non-irradiated host type colony-forming units in the spleens of mice undergoing the parental F1 hybrid disease were depleted at 5 days, and in the marrow by 7 days. (3) It was not possible to reverse the lethal course of the disease with large doses of host type hematopoietic cells injected 3 to 6 days after injection of the parental cells. (Author)

N66-23977 **Field 6R**
CFSTI Prices HC$3.00 MF$0.75
Buenos Aires Univ. (Argentina).
RADIATION DAMAGE IN MUSCLE MEMBRANES AND REGULATION OF CELL METABOLISM ANNUAL REPORT, JAN. 1 - DEC. 31, 1965.
by A. Portela. Dec 65, 61p REPT.-2, AD-629215
Contract DA-ARO-49-092-65-G71

Descriptors: Activity, Biology, Biophysics, Cell, Cesium, Damage, Effect, Enzyme, *Enzyme activity, Ion, *Membrane, *Metabolism, *Muscle, Physiology, Potassium, Potential, Radiation, *Radiation effect, Sodium, Trypsin.

For abstract, see S 04 13.

N66-24123 **Field 6R**
CFSTI Prices HC$1.00 MF$0.50
Naval School Of Aviation Medicine, Pensacola, Fla.
ENERGY DISSIPATION CHARACTERISTICS IN TISSUE FOR IONIZING RADIATION IN SPACE PROGRESS REPORT NO. 13, 1 DEC. 1965 - 28 FEB. 1966.
by H. J. Schaefer. 1966, 3p NASA-CR-71812
NASA ORDER R-75

Descriptors: Alpha, Beam, Dissipation, Dose, Energy, *Energy dissipation, Flare, Flux, Human, Ionizing, *Ionizing radiation, Proton, Radiation, *Radiation dose, Space, *Tissue.

For abstract, see S 04 13.

N66-24950 **Field 6R**
CFSTI Prices HC$1.00 MF$0.50
Pennsylvania State Univ., University Park.
PHYSICS OF CELLULAR SYNTHESIS, GROWTH AND DIVISION PROGRESS REPORT, 1 OCT. 1965 - 31 MAR. 1966.
by E. C. Pollard. 26 Apr 66, 12p NASA-CR-74755
Grant NSG-324

Descriptors: *Bacteria, Biophysics, Cell, *Cell division, Crystal, *Deoxyribonucleic acid (dna), Division, Effect, Fission, Growth, Hydrogen, Light, Mutation, Peroxide, Radiation, Scattering, Single, Suppression.

For abstract, see S 04 13.

N66-25471 **Field 6R, 18H**
CFSTI Prices HC$4.00 MF$0.75
Albert-ludwigs-universitat, Freiburg (West Germany).
THE DIAGNOSIS OF DELAYED RADIATION DAMAGE TO THE HEMATOPOIETIC ORGANS FOLLOWING CHRONIC OCCUPATIONAL RADIATION EXPOSURE.
Zur Diagnose Von Strahlenspatschaden Der Haemopoetischen Organe Infolge Beruflich Bedingter Chronischer Strahlenbelastung
by A. Preussler, and F. Wendt. Mar 66, 114p EUR-2634.D
Contract EURATOM-031-64-1 BIAD
In German, English Summary

Descriptors: Biological, *Biological cell, Bone, *Bone marrow, Cell, Damage, Dose, Effect, Group, Hematopoiesis, *Hematopoietic system, Leukemia, Marrow, *Pathological effect, Pathology, Radiation, *Radiation effect, System.

For abstract, see S 04 14.

N66-26046 **Field 6R**
CFSTI Prices HC$1.00 MF$0.50
Polish Academy Of Sciences, Warsaw.
THE DETERMINATION OF A MIXTURE OF THERMAL-NEUTRON AND GAMMA-RAY EXPOSURES BY FILM-BADGES.
by B. Filipiak, T. Musialowicz, and J. Wysopolski. 26 Nov 65, 24p CLOR/IBJ-42/D

Descriptors: Converter, Dose, Exposure, Film, Filter, Gamma, *Gamma radiation, Measurement, Mixture, Neutron, Radiation, *Radiation exposure, Thermal, *Thermal neutron.

For abstract, see S 04 14.

PB-170 889 **Field 6R**
CFSTI Prices: HC$1.00 MF$0.50
Public Health Service, Rockville, Md. Div. of Radiological Health.
RADIOLOGICAL HEALTH PROBLEMS ASSOCIATED WITH THE OPERATION OF NEUTRON GENERATORS.
by Richard F. Boggs, Robert Jacobs, and Rodger L. Leupold. 1966, 13p
Presented at the Annual Meeting of the Health Physics Society, (11th) Houston, Texas, June 30, 1966.

Descriptors: (*Neutron beams, *Health physics), (*Cockroft-Walton accelerators, Health physics), Tritium, X-rays, Shielding, Radiation hazards, Nuclear industrial applications.

The number of and uses for neutron generators has increased at a rapid rate during the past 15 years. More than 300 neutron generators have been sold, and about 200 of these units are located in the United States. A majority of the machines are controlled by neither federal nor State agencies; however, licensing for the use of tritium targets is the responsibility of the Atomic Energy Commission or the 'agreement' States. Most of the machines now in use are of the Cockroft-Walton type in which deuterons are accelerated onto a tritium target with the subsequent release of 14 MeV neutrons. Many of these relatively inexpensive machines are operated in areas where little or no health physics capability is available and, until recently, minimal information concerning the associated health hazards has been available. This paper attempts to present additional and current information related to the production of tritium X-rays, neutrons, and the resultant need for adequate shielding. (Author)

AD-483 130 **See Field 16D**

N66-25341 **See Field 6E**

PB-170 908 **See Field 18C**

PB-170 909 **See Field 18C**

PB-170 910 **See Field 18C**

6S. STRESS PHYSIOLOGY

AD-290 195 **Field 6S, 6A**
CFSTI Price: HC$2.60
California Univ., Berkeley. Dept. of Physiology.
URINARY EXCRETION PATTERNS DURING THE MANHIGH TESTS.
Final rept.
by Nello Pace, Robert L. Griswold, and Erwin R. Archibald. May 62, 26p
Contract AF 29 (600)-1530
ARL-TDR-62-7

Descriptors: (*Urinary tract, *Adrenal glands), Space flight, Space medicine, Excretion.

Urinary excretion rates of various constituents reflecting adrenocortical activity were determined by analysis of urine collected from the three pilots of MANHIGH I, II and III before, during and after their flights. Urinary excretion patterns were similarly determined for subjects who participated in the altitude chamber tests of the MANHIGH capsule and in tests performed in a mock-up of the capsule. Levels of several related substances were also measured in blood plasma samples obtained before, immediately after and two days after each of the MANHIGH flights and tests. Changes in urinary excretion pattern indicating a mild increase in adrenocortical activity were seen in only two of the seven men who participated in the MANHIGH series. (Author)

AD-638 719 **Field 6S**
Not available from CFSTI.
Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
EFFECT OF ANTERIOR INTERCOSTAL NERVE BLOCK ON THE THRESHOLD OF THORACTIC PAIN ASSOCIATED WITH gz AND gx VIBRATION.
Technical rept.
by J. H. Henzel, N. P. Clarke, and G. C. Mohr. Jul 66, 10p AMRL-TR-65-68
Proj. AF-7231
Task 723101
Availability: Published in Aerospace Medicine v37 n7 p682-7 July 1966.

Descriptors: (*Vibration, Pain), (*Acceleration tolerance, *Pain), Thresholds (Physiology), Anesthesia, Nerves, Thorax.

In investigating the origin of chest pain associated with Gz plus or minus ngz and Gx plus or minus

ngx sinusoidal vibration, the effect of anterior chest wall anesthetization was studied. Subjects were exposed to vibration of increasing amplitude and the acceleration required to induce perceptible chest pain was taken as the threshold. Two randomly ordered threshold determinations were made in each test. In one, vibration was preceded by bilateral anesthetization of the second through sixth intercostal nerves. In the other, intradermal infiltration of anesthetic created a sensation somewhat similar to this without actually blocking the nerves; this provided a control condition with minimal subjective bias for comparison. Subsequent to intercostal nerve block, there was a statistically significant ($p<0.01$) increase in threshold of chest pain for both orientations of vibration. These results strongly suggest that vibration induced chest pain originates in the chest wall and not in the more critical cardiac-great vessel complex. (Author)

AD-638 732 **Field 6S**
CFSTI Prices: HC$2.00 MF$0.50
Office of Aviation Medicine, Federal Aviation Agency, Washington, D. C.
AVIATION MEDICINE REPORTS: AN ANNOTATED CATALOG OF OFFICE OF AVIATION MEDICINE REPORTS: 1961 THROUGH 1965.
by Mary Ellen Allen, and Stanley R. Mohler. Jan 66, 33p AM-66-1

Descriptors: (*Aviation medicine, Bibliographies), Catalogs.

An annotated catalog of Office of Aviation Medicine Reports is presented as a quick reference for those engaged in civil aviation and related activities. It provides an applied summary, Author Index, and Subject Index of each OAM Report published from 1961 through 1965. (Author)

AD-638 792 **Field 6S, 6P, 6B**
CFSTI Prices: HC$2.00 MF$0.50
Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
MECHANICAL IMPEDANCE AS A TOOL IN BIOMECHANICS.
Final rept., Jul 63-Jul 64.
by Edmund B. Weis, Neville P. Clarke, and Henning E. von Gierke. Jun 66, 30p AMRL-TR-66-4
Proj. AF-7231
Task 723101

Descriptors: (*Acceleration tolerance, Human engineering), (*Vibration, Tolerances (Physiology)), Stress (Physiology), Test methods, Biophysics, Functions.

Identifiers: Mechanical impedance, Biomechanics.

The report presents new measurements of mechanical impedance in the transient acceleration environment and compares the results with previous measurements made in the steady state sinusoidal acceleration environment. Although there are some discrepancies which await further clarification, the transfer function obtained under these two environments show encouraging general correlation. With further sophistication of the method, the transient impedance measurement shows considerable potential in that a single test furnishes data over a spectrum of frequencies and provides a more general excitation condition. Although it has only been recently employed for this purpose, the practical usefulness of the impedance method as a means of establishing design criteria for protection systems is most encouraging. With further definition of the mechanodynamic properties of the body of protection system components, it appears reasonable that biomechanics can achieve the goal of providing optimized protection against the increasingly severe mechanical environments generated in aerospace vehicles and ground transportation. (Author)

AD-638 812 **Field 6S**
CFSTI Prices: HC$1.00 MF$0.50
School of Aerospace Medicine, Brooks AFB, Tex.
EFFECT OF PURE OXYGEN AT REDUCED PRESSURES ON METABOLIC CHANGES IN MICE LIVING UNDER SIMULATED BIO-SATELLITE CONDITIONS.
by L. Joe Berry, and Dorothy S. Smythe. 23 Aug 61, 10p Rept. no. 62-24
Prepared in cooperation with Bryn Mawr Coll, Pa.

Descriptors: (*Pressure breathing, *Metabolism), Space simulation chambers, Oxygen, High altitude, Hypoxia, Barometric pressure, Urea, Excretion, Carbohydrates, Biosynthesis, Adrenal glands, Cholesterol, Adrenocorticotropic hormone, Mice.

Identifiers: Non-protein nitrogen.

Metabolic changes were studied in mice that were maintained on air at simulated 14,000 or 20,000 ft. altitude, or on pure oxygen at simulated 30,000 ft. or 34,000 for a period of 3 to 5 weeks. The mice were removed from this situation only long enough each day to be fed, watered, and cleaned. The 'equivalence' between protein catabolized and carbohydrate synthesized was determined in mice injected subcutaneously with 5 mg. cortisone acetate and subsequently fasted for 17 hours. For control mice and those exposed to pure oxygen at 30,000 ft. and 34,000 ft. the equivalence was 92, 90, and 98 percent, respectively; animals on air at 14,000 ft. and at 20,000 ft., 46 and 37 percent. In all mice, the protein catabolized in response to cortisone was the same statistically, but the carbohydrate synthesized varied. Survival in mice under hypoxic conditions (14,000 to 20,000 ft.), after endotoxin injection, amounted to 35 to 46 percent; while control animals and animals kept on pure oxygen at 34,000 ft. and given endotoxin showed 84 to 86 percent survival. Low barometric pressure apparently causes an increase in urea formation about 50 percent above control levels. A sublethal injection of endotoxin drops it to normal, but these animals contain an increase in total body NPN equal to the decrease in urinary NPN. Altitude-exposed mice respond to an injection of ACTH with less increase in urinary nitrogen excretion than control mice. Their adrenals contain ess cholesterol than those of normal animals, and the cholesterol decreases less after ACTH. (Author)

AD-639 027 **Field 6S, 5E**
CFSTI Prices: HC$1.00 MF$0.50
Psychological Corp., New York.
HUMAN PROBLEMS IN THE OPERATION OF HIGH SPEED AIRCRAFT. I. ATMOSPHERIC OZONE.
by J. Schulman, J. E. Barmack, and J. D. Coakley. 1 Jun 53, 15p Memorandum no. 1
Contract N6ori-151 (01)
Proj. 20-M-1b
SPECDEVCEN-151-1-2

Descriptors: (*Ozone, Aviation medicine), (*Pilots, Aviation medicine), Human engineering, Aircraft, Atmosphere, Stress (Physiology), Toxicity.

Sufficient data exist to warrant the view that the relatively high proportion of ozone represents a potential threat to the well-being of personnel in planes operating at high altitudes.

AD-639 363 **Field 6S, 6J, 20A**
CFSTI Prices: HC$2.00 MF$0.50
Psychological Corp., New York.
THE EFFECTS OF ULTRASONIC VIBRATIONS ON MAN.
Technical rept.
Apr 48, 43p
Contract N6ori-151 (01)
NAVTRADEVCEN-151-1-15

Descriptors: (*Ultrasonic radiation, Tolerances (Physiology)), Supersonic planes, Pilots, Vibration, Performance (Human), Acoustics, Intensity, Jet engine noise, Reviews.

Contradictory reports are cited about biological and psychological effects of exposure to jet engines, to devices used to produce ultrasonic vibrations experimentally, and of participation in high speed flight. The effects upon man are alleged to involve nausea, disturbance of equilibrium, fatigue, mental confusion, headache, and auditory, visual, and motor disturbances. The effects are said to be transient. Disturbances of equilibration, fatigue, and confusion are the most frequently reported symptoms. These deleterious effects are attributed to ultrasonic vibrations. The logic by which ultrasonic vibrations become the cause is unclear in many of the reports. Effects of ultrasonic energy when applied locally to man are considered. In general, heat develops at the site of application and appropriate sensory stimulation results. Spectral analyses of the noise obtained near turbojet engines on the ground or aircraft in flight show that both sonic and ultrasonic vibrations are produced. Under the conditions studied, sonic components exceed the ultrasonic components in intensity. Intensity levels appear to be reduced as engine speed decreases. There is evidence that, with increasing air speed, the overall intensity level of the noise increases and strong energy components may appear at ultrasonic frequencies as well as in the audible range. According to one study, this tendency is exaggerated as the speed approaches a Mach number of 1.0. If it is established that exposure to vibrations from current type engines or aircraft is harmful, such effects would appear to be more closely related to the high intensities involved rather than the high frequencies arising from these sources. (Author)

AD-639 405 **Field 6S**
CFSTI Prices: HC$1.00 MF$0.50
Naval Aerospace Medical Inst., Pensacola, Fla.
LACK OF RESPONSE TO THERMAL STIMULATION OF THE SEMICIRCULAR CANALS IN THE WEIGHTLESSNESS PHASE OF PARABOLIC FLIGHT.
by Robert S. Kellogg, and Ashton Graybiel. 9 Aug 66, 14p NAMI-977
NASA order-R-93
NAVMED-MR005.04-0021.136

Descriptors: (*Weightlessness, Semicircular canals), (*Nystagmus, Weightlessness), (*Semicircular canals, Thermal conductivity), Body fluids, Stress (Physiology).

Identifiers: Endolymph, Irrigation (Medicine).

The objective of this study was to clarify the mechanism of caloric nystagmus in man by conducting the test in weightlessness. Eight subjects were selected on the basis of a strong nystagmus response to irrigation with ice water. Nystagmus was determined by oscillograph tracings and direct observation, and in addition, subjective responses of the subject were obtained. The experimental evidence indicated that, under the conditions of this experiment, zero gravity completely suppressed caloric nystagmus. This supported Barany's original hypothesis that caloric nystagmus was dependent on difference in specific weight of the endolymph in the horizontal canal. (Author)

AD-639 467 **Field 6S**
CFSTI Prices: HC$2.00 MF$0.50
Naval Aerospace Medical Inst., Pensacola, Fla.
STUDIES ON THE RESPONSE TO ACUTE ALTITUDE EXPOSURE WITH SPECIAL REFERENCE TO THE POSSIBILITY OF EARLY DETECTION OF HIGH ALTITUDE PULMONARY EDEMA.
by Hugh S. Pratt, E. Peter Beck, LeRoy S. Wirthlin, and Ashton Graybiel. 16 May 66, 35p
NAMI-964
NAVMED-MF022.03.02.5014.1

Descriptors: (*High altitude, Stress (Physiology)), (*Hypoxia, Respiratory diseases),

(*Acclimatization, High altitude), (*Lungs, Edema), Pathology, Hematology, Etiology, Blood chemistry, Antarctic regions.

The pathogenesis of acute pulmonary edema of high altitude remains unknown. The present study was designed to evaluate the baseline and acute cardiorespiratory acclimation data of a group of young males selected to construct and maintain a scientific station on the Antarctic Plateau (pressure altitude 13,500 feet). Should serious altitude sickness or pulmonary edema develop in any of these subjects, it might be possible to determine which investigations, if any, could be used to screen potentially susceptible subjects and to identify avenues for more extensive studies. The baseline studies revealed the subjects to be in good health. The acute cardiorespiratory changes, both in the altitude chamber at 14,000 feet after 36 hours and following return to sea level, were similar to those described by other authors. No evidence of overt or insipient pulmonary edema was detected. However, there was an unexpectedly high incidence of protracted nausea and vomiting, necessitating the removal of two of the subjects from the chamber. (Author)

AD-639 598 **Field 6S**
CFSTI Prices: HC$1.00 MF$0.50
School of Aerospace Medicine, Brooks AFB, Texas.
SPEED OF RECOVERY FROM CORIOLIS STIMULATION IN MOTION SICKNESS IN RELATION TO PILOTS AND NONPILOTS.
Rept. for Jun-Dec 65.
by Patrick J. Dowd. Jul 66, 11p SAM-TR-66-63
Task 775003

Descriptors: (*Motion sickness, Pilots), (*Nystagmus, Motion sickness), Aviation medicine, Equilibrium, Sensation (Physiology), Vestibular apparatus, Stimulation.

Certain flight maneuvers, such as an aircraft banking and turning, can be simulated by the USAFS-AM biaxial stimulator, resulting in a Coriolis effect. Motion sickness can easily be induced by Coriolis stimulation for both pilots and nonflyers. An ex post facto analysis of the rate of decay of vertical nystagmus was used to determine the differences between pilots and nonpilots who were sick or nonsick. Results implied that the more rapid the rate of decay of nystagmus, the more rapid the abatement of autonomic stimulation, which decreases the chances of summing activity over time to reach required levels for general visceral responses resulting in motion sickness. The findings demonstrate the effects of flying experience on the rate of decay of nystagmus elicited by a Coriolis stimulation. (Author)

AD-639 608 **Field 6S**
CFSTI Prices: HC$2.00 MF$0.50
Naval Medical Research Inst., Bethesda, Md.
PHYSIOLOGIC MECHANISMS OF MAINTAINING THERMAL BALANCE IN HIGH PRESSURE ENVIRONMENTS.
Research rept.
by Lawrence W. Raymond. 1966, 30p
NAVMED-MF-011.99-1001-10
Presented at the Conference on Marine Systems and ASW (2nd), sponsored by the American Institute of Aeronautics and Astronautics and the U. S. Navy, Los Angeles, Calif., August 10, 1966.

Descriptors: (*Body temperature, *Deep submergence), Pressure, Control, Underwater, Diving, Helium, Heat transfer, Oxygen consumption, Metabolism, Adaptation (Physiology), Performance (Human).

The review of body temperature control aims to define the optimal environment for deep submergence habitats, at pressures of 15-20 atmospheres. Environmental factors demand major attention since they will largely dictate the physiologic adjustments which will be required. Inherent changes in gas composition and density indicate major increases in surface heat transfer, depending upon atmospheric temperature and movement. Habitat insulation and ocean temperature suggest that body surface heat transfer will also be increased by radiation, but this may be modified by heating techniques, special insulation methods or by treatment of cold habitat surfaces. Humidity may be an important determinant of comfort and skin hygiene. Psychrometric methods for hyperbaric atmospheres are discussed. Experimental data on body heat transfer in helium-rich environments are presented from simulation studies. The data confirm a major increase in convective heat transfer from the skin, in helium at increased pressures. The implications of these findings upon physiologic and environmental aspects of these findings upon physiologic and environmental aspects of deep submergence programs are discussed. (Author)

AD-639 615 **Field 6S, 6L**
CFSTI Prices: HC$1.00 MF$0.50
Office of Aviation Medicine, Federal Aviation Agency, Washington, D. C.
THE AEROMEDICAL ASSESSMENT OF HUMAN SYSTOLIC AND DIASTOLIC BLOOD-PRESSURE TRANSIENTS WITHOUT DIRECT ARTERIAL PUNCTURE.
by Michael T. Lategola, Hiley Harrison, and Charles Barnard. May 66, 19p
AM-66-16

Descriptors: (*Blood pressure, Measurement), Aviation medicine, Stress (Physiology), Hyperventilation, Exercise, Electrocardiography, Decompression, Medical equipment.

A system for virtually continuous measurement of both systolic and diastolic blood pressures without recourse to direct arterial puncture has been effected by the modification of already existing standard equipment. This system entails the measurement of systolic blood pressure with a digital pressure cuff on one arm simultaneously with the measurement of diastolic blood pressure from a bracial cuff mounted on the other arm. The systolic-pressure device was used virtually unmodified. The diastolic-pressure device was originally designed to measure both systolic and diastolic pressures automatically. The modification consisted mainly in the elimination of the systolic portion of the automatic cycle. The combined system is capable of routinely obtaining measurement frequencies in the order of 20 per minute for protracted time periods. The system functions well under all resting-subject conditions and under some 'body-movement' conditions. This system is currently in routine use in all our aeromedically oriented research involving the assessment of cardiopulmonary function. (Author)

N66-26651 **Field 6S**
CFSTI Prices HC$1.00 MF$0.50
Naval School Of Aviation Medicine, Pensacola, Fla.
MODIFICATION OF VESTIBULAR RESPONSES AS A FUNCTION OF RATE OF ROTATION ABOUT AN EARTH-HORIZONTAL AXIS.
by M. J. Correia, and F. E. Guedry Jr. Mar 66, 21p NASA-CR-75112, NAMI-957
NASA ORDER R-93

Descriptors: Acceleration, Axis, Body, Disorientation, Effect, Environment, Gravity, Horizontal, Human, Linear, Motion, *Motion sickness, Nystagmus, Otolith, *Physiological response, Physiology, Response, Rotating, *Rotating environment, Sickness, Vestibular, *Vestibular effect.

For abstract, see S 04 14.

N66-26688 **Field 6S**
CFSTI Prices HC$2.00 MF$0.50
New England Medical Center Hospitals, Boston, Mass.
BIOMAGNETISM AND FERRITIN SEMIANNUAL REPORT.
by P. W. Neurath, and E. G. Sloane. 12 May 66, 21p NASA-CR-75181
Contract NGR-22-021-002

Descriptors: Assay, Biochemistry, Cell, Control, Crystalline, *Cytology, Egg, *Embryo, Fertilization, *Frog, Growth, *Histology, Influence, *Magnetic field, Photograph, Protein, Temperature.

For abstract, see S 04 14.

N66-35168 **Field 6S**
CFSTI Prices HC$1.00 MF$0.50
California Univ., Davis.
CHRONIC ACCELERATION STUDIES - PHYSIOLOGICAL RESPONSES TO ARTIFICIAL ALTERATIONS IN WEIGHT PROGRESS REPORT.
by E. L. Besch, R. R. Burton, C. F. Kelly, S. J. Sluka, and A. H. Smith. 1 Sep 66, 25p NASA-CR-77449
Contract NGR-05-004-008

Descriptors: Acceleration, *Acceleration stress, Animal, *Chicken, Chronic, Effect, Energy, Feed, *Gravitational effect, Gravity, Influence, Maintenance, *Metabolism, Requirement, Stress, Study.

For abstract, see S 04 20.

N66-35214 **Field 6S**
CFSTI Prices HC$3.00 MF$1.00
Baylor Univ., Houston, Tex.
PHYSIOLOGIC OBSERVATIONS ON RACE CAR DRIVERS.
by V. P. Collins. Sep 66, 124p NASA-CR-570
Grant NSG-730,

Descriptors: Athlete, Biochemistry, Blood, Body, Cardiovascular, *Cardiovascular system, Chemistry, Environment, *Environmental testing, Human, *Human body, Individual, Performance, Peripheral, *Physiological response, Physiology, Racetrack, Response, *Stress function, System, Testing, Tilt, Urine, Vasomotor.

For abstract, see S 04 20.

PB-170 828 **Field 6S**
CFSTI Prices: HC$1.10 MF$0.50
Civil Aeromedical Research Inst., Oklahoma City, Okla.
EFFECTS OF DECOMPRESSION ON OPERATOR PERFORMANCE.
by William F. O'Connor, and George E. Pendergrass. Apr 66, 10p
AM-66-10

Descriptors: (*Decompression, Performance (Human)), (*Pilots, Performance (Human)), Oxygen masks, Performance tests, Altitude chambers.

The study was performed to provide more quantitative estimates of degradation of pilot performance following decompression and the extent to which a decompression with mask donning interrupts the task of piloting. The experiments utilized a Scow complex coordinator and were conducted in an altitude chamber. Subjects were decompressed to altitudes from 25,000 to 41,000 feet. Results indicate impairment of performance for 2 to 4 minutes following rapid decompression. Total time loss from mask donning is much more extended than the 5 to 6 seconds required to don the mask. (Author)

PB-172 454 **Field 6S**
CFSTI Prices: HC$8.60 MF$0.75
Naval Medical Research Lab., New London, Conn.
OPERATION HIDEOUT.
Preliminary rept.
by Ralph E. Faucett, and Pierce P. Newman. 3 Jul 53, 84p NMRL-228-vol-12-n-13

NAVMED-NM-002-015.10.02. AD-65201

Descriptors: (*Respiration, Submarine personnel), (*Carbon dioxide, Toxicity), Psychomotor tests, Motor reactions, Sensory perception, Problem solving, Attention, Electrolytes (Physiology), Oxygen consumption, Excretion, Bicarbonates, Acidosis, Hematology, Electroencephalography, Psychometrics, Personality.

Identifiers: Hideout operation.

In order to determine the effects of prolonged exposure to 1.5 per cent carbon dioxide, twenty-three human volunteers were placed aboard a partially activated fleet type submarine for a period of two months and were exposed to that percentage of carbon dioxide during six weeks of this period. Prior to, during, and after the exposure period, measurements of physiological functions and psychomotor performance were made. Certain physiological changes occurred which indicated a definite response to this concentration of carbon dioxide. These changes were: a decrease in the respiratory response to carbon dioxide, and a consistent decrease in eosinophil count. There was a slight fall in serum pH consistent with a very mild respiratory acidosis and the urinary excretion of bicarbonate rose to levels significantly greater than normal in the last four weeks of exposure. Measurements of psychomotor performance, including simple motor responses, sensory discrimination, complex motor coordination, and alertness, revealed no significant decrement in these functions. (Author)

AD-638 733 See Field 6O

D-638 745 See Field 6P

AD-638 879 See Field 6A

AD-638 899 See Field 6A

AD-639 059 See Field 22A

AD-639 339 See Field 6T

AD-639 342 See Field 5I

N66-35138 See Field 5J

6T. TOXICOLOGY

AD-639 339 **Field 6T, 6S**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
TOXIC EFFECT OF HIGH OXYGEN PRESSURES ON THE ANIMAL ORGANISM.
by S. I. Pikladovitskii. 11 Aug 66, 23p FTD-TT-65-1983
TT-66-61416
Supersedes AD-633 773. Unedited rough draft trans. of Fiziologicheskii Zhurnal SSSR, v20 n3 p507-17 1936.

Descriptors: (*Oxygen, Toxicity), Pressure, Stress (Physiology), Thresholds (Physiology), Aging (Physiology), Strychnos alkaloids, Dosage, Convulsive disorders, Poisoning, High-pressure research, Brain, Pressure breathing, Cerebral cortex, Stimulation, Mice, USSR.

A high oxygen partial pressure has various effects on young white mice depending upon their age. The intraperitoneal, subcutaneous and intracapital introduction of wormtree essence in adult white mice causes the appearance of spasma analogous to the ones which are detected during intravenal injection of the preparatus into dogs. The 'threshold' dosage of wormtree amounts for adult white mice is 0.025 g per 100 g of animal weight. Young white mice react to intraperitobal injection of wormtree differently, depending upon age. An intraperitonael introduction of strychnine solution (1:2000) in white mice causes accidents of typical 'Strychnine' pains. Three age brackets for the irritation of the cortex by electrical and chemical irritants can be established in white mice. In its totality these results confirm the assumption that spasma, which appear in warm blooded animals under the effect of high partial oxygen pressures, are the result of an irritation in the cerebral cortex. (Author)

N66-25526 **Field 6T**
CFSTI Prices HC$1.00 MF$0.50
Public Health Service, Phoenix, Ariz.
LABORATORY FOR MONITORING BACTERIAL CONTAMINATION OF SPACE COMPONENTS QUARTERLY REPORT, JAN. - MAR. 1966.
Apr 66, 8p NASA-CR-74868
NASA ORDER R-137
Its Rept.-12

Descriptors: Bacillus, *Contamination, Fallout, Microbe, *Microorganism, Organic, Plastics, Polystyrene, Recovery, Solid, *Solvent, Spacecraft, *Spore, Stainless steel, Viability.

For abstract, see S 04 14.

N66-35012 **Field 6T**
CFSTI Prices HC$3.00 MF$0.75
California Univ., Berkeley.
STUDY OF ENVIRONMENTAL EFFECTS ON CELLULAR AUTOXIDATION FINAL REPORT, MAR. 1, 1965 - FEB. 29, 1966.
by D. B. Menzel. 1966, 82p NASA-CR-77392
Contract NGR-05-003-090

Descriptors: Animal, *Biochemistry, Brain, Cell, Enzyme, Lipid, *Lipid metabolism, Liver, Lung, Membrane, Metabolism, Oxygen, *Oxygen toxicity, *Rat, Study, Tissue, Toxicity.

For abstract, see S 04 20.

N66-35268 **Field 6T**
CFSTI Prices HC$2.00 MF$0.50
United Kingdom Atomic Energy Authority, Harwell (England).
STUDIES ON THE RETENTION AND METABOLISM OF INHALED METHYL IODIDE. 2 - RETENTION OF METHYL IODIDE.
by A. Morgan, and D. J. Morgan. May 66, 28p
AERE-R-5117

Descriptors: Contamination, Dose, Hazard, *Inhalation, Iodide, *Iodine 132, Methyl, *Radioactive contamination, Radioactivity, Rate, Respiratory, Retention, Safety.

For abstract, see S 04 20.

AD-638 788 See Field 6A

AD-639 060 See Field 6K

PB-170 827 See Field 6F

PB-172 958 See Field 6O

PB-172 959 See Field 6O

PB-172 960 See Field 6O

PB-172 967 See Field 6O

PB-172 968 See Field 6O

PB-172 969 See Field 6O

PB-172 970 See Field 6O

PB-172 971 See Field 6O

PB-172 972 See Field 6O

PB-172 973 See Field 6O

PB-173 008 See Field 6O

PB-173 009 See Field 6O

PB-173 011 See Field 6O

PB-173 012 See Field 6O

PB-173 013 See Field 6O

7A. CHEMICAL ENGINEERING

AD-638 704 **Field 7A**
Not available from CFSTI.
AeroChem Research Labs., Inc., Princeton, N. J.
EFFECTS OF CONVECTIVE DIFFUSION ON THE APPARENT KINETICS OF ZEROTH ORDER SURFACE-CATALYSED CHEMICAL REACTIONS.
Revised ed.
by Daniel E. Rosner. 18 Aug 65, 19p
Contract AF 49 (638)-1138
Proj. AF-9750
Task 975002
AFOSR-66-1804
Revision of manuscript submitted 12 Sep 64.
Availability: Published in Chemical Engineering Science v21 p223-39 1966.

Descriptors: (*Catalysis, *Reaction kinetics), (*Heat exchangers, Catalysis), Diffusion, Convection (Heat transfer), Surface properties, Laminar boundary layer, Turbulent boundary layer, Catalysts, Fluid flow.

Identifiers: Reactors (Chemical).

The apparent kinetics of zeroth order surface-catalysed reactions were quantitatively investigated for several configurations involving laminar or turbulent boundary layer flow, with or without pressure gradient. Nine cases of interest were solved exactly in terms of the incomplete beta function and analytical and graphical results are presented and compared with the results of applying the familiar quasi-stationary approximation. The latter method, which is equivalent to the use of the concept of 'local resistance additivity,' is shown to fail badly in this chemical kinetic extreme. Applications of the theory to the interpretation of kinetic data and the design of catalytic heat exchangers are discussed. (Author)

AD-639 185 **Field 7A, 20D, 20M**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
THE EFFECT OF CHEMICAL REACTIONS ON DIFFUSION-CONVECTIVE ENERGY TRANSFER. I. LAMINAR-DIFFUSION BOUNDARY LAYER IN THE PRESENCE OF A HETEROGENEOUS REACTION ON A CATALYTIC WEDGE-SHAPED SURFACE.
by V. I. Makaryavichyus, and M. M. Tamonis.
3 Aug 66, 20p TG-230-T490
Contract NOw-62-0604-c
TT-66-62292
Trans. of Akademiya Nauk Litovskoi, SSR, Vilna. Trudy. Seriya B., n4 (43) p153-64 1965.

Descriptors: (*Chemical reactions, *Transport properties), (*Diffusion, Laminar boundary layer), Integral equations, Reaction kinetics, Wedges, USSR.

Identifiers: Energy transfer.

The equation of diffusion of a chemically reacting substance in the presence of a heterogeneous reaction on an isothermal surface is solved by the integral method using a cubic profile of the concentration in the boundary layer. This solution of the diffusion equation satisfies the power approximation of the non-linear boundary condition. If the chemical reaction rate depends on the concentration of several components, then the solution of the diffusion equation is also a function of the complex pi, which takes into account the magnitude of the initial concentrations and of the diffusion coefficients of the individual components. To generalize the

resultant diffusion-convective energy transfer, the potential of the chemical energy transfer of a reacting system is introduced. (Author)

AD-639 200 **Field 7A, 21I**
CFSTI Prices: HC$23.00 MF$1.25
Air Reduction Sales Co., Murray Hill, N. J. Chemical Research Div.
OZONE PREPARATION AND STABILITY IN HIGH CONCENTRATIONS. VOLUME 2. BIBLIOGRAPHY.
Final rept.
by Alfred H. Taylor. 1950, 234p
Contract NObs-46854

Descriptors: (*Ozone, Bibliographies), Chemical analysis, Physical properties, Chemical reactions, Production, Toxicity, Abstracts.

The bibliography covers the literature concerning the analysis, physical properties, production, reactions, and toxicity of ozone which appeared through the middle of 1949. An abstract is included for each entry.

N66-24484 **Field 7A**
CFSTI Prices HC$2.00 MF$0.50
General Astrometals Corp., Yonkers, N. Y.
THE PREPARATION OF ULTRA-FINE BERYLLIUM POWDER BY THE AMALGAM PROCESS.
by C. O. Gale, V. Griffiths, F. Habashi, and G. T. Hanson. Nov 65, 35p NASA-CR-74009
Contract NASW-1099

Descriptors: *Beryllium, Chloride, Electrochemistry, Electrolysis, Eutectic, Fine, Mixture, Molten, *Molten-salt electrolyte, Pilot, *Pilot plant, Plant, Powder, Production, Salt, Sodium, *Sodium chloride.

For abstract, see S 04 13.

N66-25564 **Field 7A**
CFSTI Prices HC$4.00 MF$1.00
Lockheed Missiles And Space Co., Sunnyvale, Calif.
DESIGN AND FABRICATION OF A TRACE CONTAMINANT REMOVAL SYSTEM FOR APOLLO, PHASE III FINAL REPORT, SEP. 1965 - FEB. 1966.
14 Apr 66, 142p NASA-CR-65358, M-58-65-3
Contract NAS9-3415

Descriptors: Activity, *Apollo spacecraft, Atmosphere, Cabin, *Cabin atmosphere, Carbon monoxide, Catalyst, *Catalytic activity, *Contamination, Hydrogen, Material, Methane, Palladium, Platinum, Removal, *Sorption, Spacecraft, Sulfide, System, Testing.

For abstract, see S 04 14.

N66-26257 **Field 7A**
CFSTI Prices HC$2.00 MF$0.50
Pyrogenics, Inc., Woodside, N. Y.
A STUDY OF THE USE OF VAPOR AND VACUUM DEPOSITION TECHNIQUE FOR THE DEVELOPMENT OF HIGH STRENGTH FILAMENTARY MATERIALS SUMMARY TECHNICAL REPORT, MAY 21, 1964 - MAY 21, 1965.
by E. J. Hughes. 1965, 39p NASA-CR-75022
Contract NASW-927

Descriptors: Argon, *Deposition, Filament, Film, Gold, Graphite, Liquid, *Liquid metal, Material, Metal, Methane, Platinum, Pyrolysis, *Pyrolytic graphite, Solid, Substrate, Thin, *Thin film, Vacuum, Vapor.

For abstract, see S 04 14.

AD-639 140 **See Field 11F**

AD-639 349 **See Field 21D**

AD-639 582 **See Field 6K**

AD-639 583 **See Field 6K**

PB-170 708 **See Field 13H**

7B. INORGANIC CHEMISTRY

AD-638 735 **Field 7B, 7D**
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
STUDIES IN HIGH TEMPERATURE MASS SPECTROMETRY.
Progress rept. no. 3, 1 Oct 65-31 Mar 66.
by Alfred E. Buchler. 31 Mar 66, 3p
Contract DA-31-124-ARO (D)-315
Proj. DA-1C014501B13A

Descriptors: (*Mass spectroscopy, High-temperature research), (*Alkali metal compounds, Molecular structure), (*Cesium compounds, Molecular structure), Hydroxides, Borates, Sulfates, Molecular beams, Oxides, Sulfuric acid, Vapors.

Identifiers: Cesium sulfate.

A summary is given of studies of molecular structure by electric deflection and mass spectrometry. The systems studied included alkali hydroxides and metaborates and cesium sulfate and related compounds.

AD-638 774 **Field 7B, 7D**
Not available from CFSTI.
Missouri Univ., Rolla.
THE DIVALENCY OF TIN IONS FORMED DURING ANODIC DISSOLUTION AND THE BEHAVIOR OF THE TIN ANODE.
Technical rept.
by M. E. Straumanis, and M. Dutta. 19 Nov 65, 5p TR-15
Contract Nonr-2296 (03)
Availability: Published in Inorganic Chemistry v5 n6 p992-5 Jun 1966.

Descriptors: (*Tin, Valence), (*Solubility, Tin), Anodes, Acids, Decomposition, Electrochemistry, Ions, Solutions, Surfaces.

Tin was found to form solely Sn (2+) ions when dissolved anodically without the use of an external current from tin amalgam in aqueous solutions of HCl, H_2SO_4, $HClO_4$, H_3PO_4, HNO_3, and HF. Darkening of the surface of a solid tin anode was observed during electrolytic dissolution up to current densities of 1200 ma/sq cm in HCl, H_2SO_4, and $HClO_4$, but there was no spalling of particles. The black entities protruding from the anodic surface were in contact with the surface of the anode and consisted of metallic tetragonal tin. They were formed owing to the uneven electrolytic surface attack of the tin anode. (Author)

AD-638 814 **Field 7B**
CFSTI Prices: HC$1.00 MF$0.50
Ballistic Research Labs., Aberdeen Proving Ground, Md.
THE PRODUCTION OF ATOMIC OXYGEN BY THE THERMAL DECOMPOSITION OF OZONE.
by John R. Kelso. Jun 66, 23p BRL-1323
Proj. NWER-07.010

Descriptors: (*Oxygen, atoms), (*Ozone, decomposition), Upper atmosphere, Production.

To study the reactions of atomic oxygen it is desirable to have a supply that is free of metastable energetic species of molecular and atomic oxygen which are formed in discharged oxygen and because of their side reactions can lead to serious errors in calculations. Therefore, the homogeneous, thermal, gas phase decomposition of dry ozone was tried and found to be a satisfactory source if the residence time of ozone in the furnace is carefully regulated by furnace length and carrier gas flow, followed by rapid cooling of the products of decomposition. (Author)

AD-638 869 **Field 7B, 20B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
USING THE X-RAY ANALYSIS METHOD DURING THE SYNTHESIS OF LEAD, ZINC, MERCURY SELENITES, AND MERCURY SELENIDE.
by N. A. Filippova, L. A. Martynova, and E. V. Savina. 6 Jun 66, 9p FTD-TT-65-1535
TT-66-62222
Unedited rough draft trans. of Gosudarstvennyi Nauchno-Issledovatelskii Institut Tsvetnykh Metallov. Sbornik Nauchnykh Trudov (USSR), n19 p795-9 1962.

Descriptors: (*Lead compounds, X-ray diffraction analysis), (*Selenium compounds, Synthesis (Chemistry)), (*Zinc compounds, X-ray diffraction analysis), (*Mercury compounds, X-ray diffraction analysis), Oxides, Selenides, Chemical analysis, Crystallography, Crystal lattices, USSR.

Identifiers: Mercuric selenide, Mercury selenite, Lead selenite, Zinc selenite.

During the development of phase analysis it was necessary to synthesize lead, zinc, mercury selenites, and mercury selenide. For the synthesis of selenites the Chukhlantsev method was basically used, and for the synthesis of mercury selenide - the Benzing method. Identification of compounds was carried out basically by two independent analysis methods - chemical and x-ray. (Author)

AD-638 931 **Field 7B, 7D**
Not available from CFSTI.
Cornell Univ., Ithaca, N. Y. Dept. of Chemistry.
GASEOUS BOROXINE: MECHANISMS OF REACTIONS WITH OXYGEN AND CARBON MONOXIDE.
by George H. Lee II, and Richard F. Porter. 18 Apr 66, 5p
AROD-4390:9
Availability: Published in Inorganic Chemistry v5 n8 p1329-33 Aug 1966.

Descriptors: (*Boron compounds, Reaction kinetics), Gases, Oxygen, Carbon monoxide, Spectra (Infrared), Boranes, Oxygen compounds.

Identifiers: Boroxins.

Reactions of gaseous boroxine ($H_3B_3O_3$) with O_2 and CO were investigated by infrared absorption techniques. Kinetic measurements indicate that the reactions $H_3B_3O_3$ (g) + 1/2 O_2 (g) = $H_2B_2O_3$ (g) + 1/3 B_2O_3 (s) + 1/6 B_2H_6 (g), and $H_3B_3O_3$ (g) + CO (g) = BH_3CO (g) + B_2O_3 (s), are first order in $H_3B_3O_3$ pressure and approximately zero order in O_2 and CO pressure. The rates for both reactions are accelerated in reaction vessels coated with B_2O_3 (s). Plausible heterogeneous mechanisms for these reactions in B_2O_3-coated vessels are proposed. (Author)

AD-638 938 **Field 7B, 7D**
Not available from CFSTI.
Cornell Univ., Ithaca, N. Y. Dept. of Chemistry.
MASS SPECTROMETRIC STUDY OF INTERMEDIATES IN THE OXIDATION OF B_5H_9, B_4H_{10}, AND BH_3CO.
by Lawrence Barton, C. Perrin, and Richard F. Porter. 11 Feb 66, 7p
AROD-4890:10
Availability: Published in Inorganic Chemistry v5 n8 p1446-52 Aug 1966.

Descriptors: (*Boranes, Oxidation), (*Pentaboranes, Oxidation), Mass spectroscopy, Reaction kinetics, Oxygen, Boron compounds, Oxides, Carbon monoxide, Labeled substances, Catalysis.

Identifiers: Boroxins, Tetraboranes.

A mass spectrometric technique was used to follow the stoichiometry of oxidation of B_5H_9.

B4H10, and BH3CO as O2 is slowly added to a borane sample at pressures between 5 and 20 mm. In the B5H9-O2 reaction boroxine (H3B3O3) is formed initially and further oxidation yields H2B2O3 (g). Boroxine formed when B5H9 reacts with 16O2-18O2 mixtures contains oxygen atoms in a statistical distribution while the oxidized product, H2B2O3, contains oxygen in a nonstatistical distribution. Boroxine is not produced in the initial stage of oxidation of B4H10 and BH3CO, but H2B2O3 produced with 16O2-18O2 mixtures contains oxygen atoms in a nonstatistical distribution. Results of these isotope distribution experiments indicate that the precursor to H3B3O3 (and H2B2O3) in the B5H9-O2 reaction is probably HBO or H2BOH. In the B4H10-O2 and BH3CO-O2 reactions the precursor to H2B2O3 is probably H3BO2 (borane peroxide). Solids produced in the reaction of B5H9 and O2 act as a catalyst to accelerate the decomposition of H3B3O3 (g). (Author)

AD-638 945 **Field 7B, 7D**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Chemistry.
VALENCY TAUTOMERISM IN METAL-OLEFIN COMPLEXES. CYCLOOCTATETRAENEMOLYBDENUM, -CHROMIUM, AND -IRON TRICARBONYLS.
by C. G. Kreiter, A. Maasbol, F. A. L. Anet, H. D. Kaesz, and S. Winstein. 16 Apr 66, 3p
Contrib-1942
Grants NSF-GP-4175, NSF-GP-3780
AROD-3580:26
Availability: Published in Journal of the American Chemical Society v88 p3444 1966.

Descriptors: (*Metal carbonyls, *Valence), (*Complex compounds, Metal carbonyls), (*Cyclooctatetraene, Complex compounds), Molybdenum compounds, Chromium compounds, Iron compounds, Molecular isomerism, Nuclear magnetic resonance, Molecular orbitals, Synthesis (Chemistry).

Identifiers: Cyclooctatetraene molybdenum carbonyls, Cyclooctatetraene chromium carbonyls, Cyclooctatetraene iron carbonyls.

A report is given on the temperature dependence of the nmr spectrum of C8H8M0 (CO)3 and that of the analogous complex C8H8Cr (CO)3 which was synthesized for the first time. Also, a reinvestigation of C8H8Fe (CO)3 confirmed previous unpublished reports that the nmr spectrum remains essentially a single sharp line down to very low temperatures (ca. -100C). However, by using still lower temperatures,-140 to -150C, it was possible to observe the nmr spectrum of the 'frozen' complex. The new compound C8H8Cr (CO)3 was obtained as red-brown crystals in 20% yield by stirring cyclooctatetraene with (NH3)3Cr (CO)38 in refluxing n-hexane for 65 hr.

AD-639 269 **Field 7B**
Not available from CFSTI.
San Diego State Coll., Calif. Dept. of Chemistry.
FORMATION AND CLEAVAGE OF THE SILICON-SILICON BOND IN DISILANE.
by R. C. Kennedy, L. P. Freeman, A. P. Fox, and M. A. Ring. 2 Nov 65, 4p
Grant DA-ARO (D)-31-124-G465
AROD-4192:5
Availability: Published in J. Inorg. Nucl. Chem. v28 p1373-7 1966.

Descriptors: (*Silanes, Chemical bonds), Synthesis (Chemistry), Decomposition, Condensation reactions, Catalysis.

Identifiers: Disilanes.

Disilane was obtained in a 35 per cent yield from the reaction between potassium silyl and bromosilane in 1-2 dimethoxyethane. The yield was found to be dependent on the residence time of disilane in the reaction system. Lithium halide catalysed condensation reactions of disilane were observed and the relation between these reactions and the silyl-bromosilane reaction are discussed. (Author)

AD-639 331 **Field 7B**
CFSTI Prices: HC$3.00 MF$0.75
Beckman Instruments, Inc., Fullerton, Calif.
ULTRAVIOLET OXYGEN DETECTOR.
Final rept. Mar-Dec 65,
by Ronald G. Hughes. Jun 66, 68p AM-2360-201
Contract AF 33 (615)-2383
Proj. AF-6373
Task 637302
AMRL-TR-66-77

Descriptors: (*Ultraviolet detectors, *Oxygen), Absorption spectrum, Ultraviolet spectroscopy, Ultraviolet spectrophotometers, Pressure, Intensity, Phototubes, Photomultipliers, Design.

An ultraviolet oxygen sensor has been investigated, designed, fabricated and tested which is to photoelectrically measure the partial pressure of oxygen in the pressure range from 100 to 500 torr. A krypton source was used to illuminate the Fery prism which is the dispersing element of a dual beam single monochromator set to pass energy in the Schumann-Runge absorption continuum band of oxygen in the wavelength region of 1450 to 1510 A. Since the absorption coefficient of oxygen has an average value of 350/cm in this band, absorption spectroscopy is employed in the measurement of oxygen concentration by passing the selected band of radiation from the monochromator through a .014 cm path length of oxygen gas. By monitoring the change in luminous energy falling on the photocathode of a photomultiplier tube, one can determine the partial pressure of the gas for a specified temperature. Lambert's Law demonstrates the change in intensity for a constant distance and due to the variation of k with a change in pressure. The partial pressure is read out directly on a 0-100 microamp meter which receives the signal from a ratioing, Darlington, current amplifier system. The amplifier obtains the primary signals from the current outputs of two RCA-type CF0129C phototubes positioned to detect light from an absorbing path and a reference path. (Author)

AD-639 412 **Field 7B**
Not available from CFSTI.
Georgetown Univ., Washington, D. C. Dept. of Chemistry.
HETEROPOLY BLUES. I. REDUCTION STOICHIOMETRIES AND REDUCTION POTENTIALS OF SOME 12-TUNGSTATES.
by Michael T. Pope, and Gideon M. VARGA Jr.
7 Jan 66, 6p
Grant DA-ARO (D)-31-124-G512
AROD-4598:2
Supported in part by Petroleum Research Fund, American Chemical Society.
Availability: Published in Inorganic Chemistry v5 p1249-54 1966.

Descriptors: (*Tungstates, Reduction (Chemistry)), Ions, Oxidation-reduction reactions, Phosphorus compounds, Silicon compounds, Iron compounds, Cobalt compounds, Electrostatics, Volumetric analysis, Polarographic analysis.

Identifiers: Heteropoly blues.

The reduction of five isostructural polytungstates, the heteropolyanions, (PW12O40) (3-), (SiW12O40) (4-), (Fe (III)W12)40 (5-), (Co (II)W12O40 (6-), and the isopolymetatungstate anion, (H2W12O40) (6-), was studied by polarographic and potentiometric methods. Each anion can accept two electrons without decomposition. Further electrons can be added in acidic solutions where protonation can accompany reduction and keep the over-all ionic charge low. In neutral solutions, reduction proceeds until the charge on the reduced species is-8. Formal reduction potenials for the intial one-electron reductions vary with the ionic charge in a manner consistent with a simple electrostatic model for the electron affinities of these approximately spherical polyanions. (Author).

N66-24118 **Field 7B**
CFSTI Prices HC$1.00 MF$0.50
Stanford Research Inst., Menlo Park, Calif.
STUDY OF GROWTH PARAMETERS FOR REFRACTORY CARBIDE SINGLE CRYSTALS QUARTERLY STATUS REPORT NO. VIII, 1 DEC. 1965 - 1 MAR. 1966.
by R. W. Bartlett. 5 Apr 66, 15p NASA-CR-74012
Contract NASR-49/19/
Its Rept.-8

Descriptors: *Carbide, Crystal, *Crystal growth, Film, Furnace, Gradient, Growth, Liquid, Material, Metal, Parameter, Refractory, *Refractory material, Single, *Single crystal, Solution, Temperature, Thin.

For abstract, see S 04 13.

N66-24921 **Field 7B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
THE NATURE OF THE HIGHER SILVER OXIDE.
O Prirode Vysshego Okisla Serebra
by I. A. Kazarnovskiy, and A. B. Neyding. Apr 66, 13p NASA-TT-F-10110
Transl. Into English From Dokl. Akad. Nauk Sssr (Moscow), V. 78, No. 4, 1951 P 713-716

Descriptors: *Anomaly, Crystal, *Crystal lattice, Electroconductivity, Lattice, Magnetic, *Magnetic susceptibility, Oxide, Powder, Property, Silver, *Silver oxide, Susceptibility, U.s.s.r..

For abstract, see S 04 13.

N66-25546 **Field 7B**
CFSTI Prices HC$3.00 MF$0.75
Battelle Memorial Inst., Columbus, Ohio.
THE USE OF SILVER OXIDE AS A REGENERATIVE CARBON DIOXIDE SORBER.
by J. F. Foster. May 66, 71p NASA-CR-496
Contract NAS2-1609

Descriptors: Atmosphere, Cabin, *Cabin atmosphere, *Carbon dioxide, Decomposition, Energy, Foil, Layer, Oxide, Regeneration, Silver, *Silver oxide, *Sorption, Space, Surface.

For abstract, see S 04 14.

N66-26877 **Field 7B**
CFSTI Prices HC$3.00 MF$0.75
General Dynamics Corp., Groton, Conn.
THE SYNTHESIS AND UTILIZATION OF LOW MOLECULAR WEIGHT OZONIDES FOR AIR REVITALIZATION PURPOSES INTERIM REPORT, 14 AUG. 1964 - 14 OCT. 1965.
by A. Capotosto Jr. and A. W. Petrocelli. 14 Nov 65, 87p NASA-CR-75281, U413-65-204
Contract NASW-559

Descriptors: Absorption, Calcium, *Calcium compound, Carbon dioxide, Characteristics, Chemical, Hydrogen, Hydroxide, Kinetics, Magnetic, Mechanism, *Ozonide, *Peroxide, Potassium, Sodium, Superoxide, Susceptibility, *Synthesis.

For abstract, see S 04 14.

N66-34374 **Field 7B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
KINETICS OF THE FLUORINATION OF IRON.
by P. M. Odonnell. Aug 66, 14p NASA-TN-D-3575

Descriptors: Activation, Compound, Defect, Effect, Energy, *Film, Fluoride, *Fluorination, Growth, Iron, *Iron compound, *Kinetics, Mechanism, Pressure, Property, Surface, Temperature.

For abstract, see S 04 20.

N66-34376 **Field 7B**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
DESORPTION KINETICS OF MULTIPLE ADSORBATES - CESIUM WITH FLUORINE ON MOLYBDENUM AND TUNGSTEN.
by L. K. Tower. Aug 66, 37p NASA-TN-D-3596

Descriptors: Activation, Adsorption, *Cesium, *Desorption, Diode, Dissociation, Energy, Fluoride, Fluorination, *Fluorine, Function, Hafnium, *Kinetics, *Molybdenum, Osmium, Property, Surface, Tantalum, Thermionic, *Thermionic diode, *Tungsten, Work.

For abstract, see S 04 20.

N66-34575 **Field 7B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
ACCURACY OF THREE METHODS FOR DETERMINATION OF OXYGEN IN POTASSIUM AT CONCENTRATIONS LESS THAN 20 PARTS PER MILLION.
by R. F. Gahn, and L. Rosenblum. Aug 66, 18p NASA-TN-D-3239

Descriptors: Accuracy, Activation, Amalgam, Analysis, Contamination, Distillation, Impurity, Neutron, *Oxygen, *Potassium, *Quantitative analysis, Quantity, Trace, *Trace contaminant, Vacuum.

For abstract, see S 04 20.

N66-35226 **Field 7B**
CFSTI Prices HC$3.00 MF$0.50
Lexington Labs., Inc., Cambridge, Mass.
DEVELOPMENT OF PIGMENTS FOR THERMAL CONTROL COATINGS FINAL REPORT, 17 JUN. - 16 DEC. 1965.
by D. W. Jones, and P. S. Schaffer. Apr 66, 51p NASA-CR-77481
Contract NAS8-20162

Descriptors: Aluminum, Coating, Control, Insulation, Metal, *Metal oxide, Metallurgy, *Nucleation, Oxide, Phase, *Pigment, *Powdered metal, Power, Protection, Silicon, Temperature, *Temperature control, Thermal, Titanium, Vapor, Zinc, Zirconium.

For abstract, see S 04 20.

AD-638 753 **See Field 11B**

AD-638 836 **See Field 7C**

AD-638 840 **See Field 7D**

AD-638 918 **See Field 8G**

AD-638 944 **See Field 7D**

AD-638 946 **See Field 7D**

AD-638 947 **See Field 7D**

AD-639 023 **See Field 7D**

AD-639 262 **See Field 7D**

7C. ORGANIC CHEMISTRY

AD-477 989 **Field 7C**
CFSTI Prices: HC$4.60 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
ATTEMPTS TO PREPARE FLUOROETHERS WITH EMPHASIS ON THE USE OF LITHIO-PERFLUOROALKANES IN ORGANIC SYNTHESIS.
Technical rept.
by Peter Johncock. Nov 65, 43p TR-65245

Descriptors: (*Fluorine compounds, Synthesis (Chemistry)), Feasibility studies, Polymers, Ethers, Elastomers, Alkanes, Metalorganic compounds, Lithium compounds, Spectra (Infrared), Carboxylic acids, Salts, Octanoic acids, Fatty acids, Butane, Great Britain.

In the search for new elastomers suitable for use at high temperatures, certain aliphatic poly (fluoroethers) appear promising candidates for the base polymer. Attempts made to prepare as a model (bis- (1-1-di-H-heptafluorobutyl) ether, by potential polymer forming reactions, were unsuccessful: perfluoro-n-propyl-lithium was insufficiently stable to undergo condensation with symdichlorodimethyl ether, and O-alkylation of 1-1-di-H-heptafluorobutyl trifluoromethane- sulphonate with sodium 1-1-di-H-heptafluorobutoxide could not be effected. Perfluoro-n-heptyl-lithium and 1-4-dilithio-octafluorobutane were prepared by halogen-metal exchange and characterised by their reactions with acetaldehyde: they are much less stable than perfluoro-n-propyl-lithium. The proportion of alkyl-lithium compound used for the exchange had a considerable effect on the stability of the fluoro-organometallic reagent. Perfluoro-n-propyl-, perfluoroisopropyl-, and perfluoro-n-heptyl-lithium could be carboxylated at low temperature. (Author)

AD-638 836 **Field 7C, 7B**
Not available from CFSTI.
Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
THE CLEAVAGE OF SILANES BY OXIDES OF NITROGEN.
by Leonard Spialter, and J. Dudley Austin. 17 Feb 66, 5p ARL-66-0126
Proj. AF-7023
Availability: Published in Journal of American Chemical Society v88 p1828 1966.

Descriptors: (*Silanes, Decomposition), (*Nitrogen compounds, Oxides), Chemical reactions, Organic compounds.

Identifiers: Nitrogen oxides.

The oxides of nitrogen, generally called 'nitrogen dioxide,' 'nitrogen trioxide,' nitric oxide (NO), and nitrous oxide (N2O), are reported individually to react cleanly with Si-X bonds, where X=H, OH, OR, Si, alkyl, and aryl, to give cleavage products at room temperature. (Author)

AD-638 860 **Field 7C, 7D, 11I**
Not available from CFSTI.
Stanford Univ., Calif. Dept. of Chemistry.
RANDOM-COIL CONFIGURATIONS OF VINYL POLYMER CHAINS. THE INFLUENCE OF STEREOREGULARITY ON THE AVERAGE DIMENSIONS.
by P. J. Flory, J. E. Mark, and A. Abe. 8 Oct 65, 14p
Contract AF 49 (638)-1341
Proj. AF-9760
Task 976003
AFOSR-66-1539
Availability: Published in Journal of American Chemical Society v88 n4 p639-50 Feb 20 1966.

Descriptors: (*Polymers, Molecular association), (*Vinyl plastics, Molecular properties), (*Stereochemistry, Vinyl plastics), Chemical bonds, Molecular structure, Crystal structure, Helixes, Molecular energy levels.

The random-coil configurations of alpha-olefin polymers (-CH2CHR-)n/2, where R = CH3 or CH2CH3, etc., are treated in terms of three rotational states for each skeletal bond, the states being weighted as dictated by interactions between CH, CH2, and R groups separated by three and by four C-C bonds. Interactions between these groups produce systematic displacements of the rotational states from symmetrical positions of 0 and plus or minus 120 degrees for trans and gauche conformations, respectively. The treatment is applied to isotactic, syndiotactic, and atactic chains, with proper account of the configurations of the asymmetric CHR centers in each instance. Characteristic ratios calculated for a perfect isotactic chain are much greater than observed by experiment. Also, a large negative temperature coefficient is predicted, contrary to observations. These large discrepancies are not diminished by adoption of a more realistic array of four rotational states for each bond, or by incorporation of refinements suggested by detailed calculations of the conformational energy of 2,4-dimethylpentane as a function of its internal rotation angles. Agreement can be achieved, however, by postulating the presence of ca. 5 to 10% of syndiotactic units in isotactic polymers of n-butene-1 and n-pentene-1. The high degrees of crystallinity and narrow melting ranges found for typical isotactic polymers can be reconciled with so large a proportion of heterotactic units only if these units are incorporated in the crystalline phase as imperfections. Effects on the crystalline structure are discussed. (Author)

AD-638 861 **Field 7C, 7D, 11**
Not available from CFSTI.
Stanford Univ., Calif. Dept. of Chemistry.
CONFORMATIONAL ENERGIES OF n-ALKANES AND THE RANDOM CONFIGURATION OF HIGHER HOMOLOGS INCLUDING POLYMETHYLENE.
by A. Abe, R. L. Jernigan, and P. J. Flory. 8 Oct 65, 11p
Contract AF 49 (638)-1341
Proj. AF-9760
Task 976003
AFOSR-66-1062
Availability: Published in Journal of the American Chemical Society v88 n4 p631-9 Feb 20 1966.

Descriptors: (*Alkanes, *Stereochemistry), (*Polymers, Molecular association), Chemical bonds, Butane, Molecular energy levels, Molecular isomerism, Thermochemistry, Helixes.

Identifiers: Molecular conformations, Pentanes, Polymethylenes.

Conformation energies of n-butane and n-pentane were calculated as functions of their C-C bond rotation angles using semiempirical expressions for the repulsive and attractive energies between nonbonded atom pairs and an intrinsic threefold torsion potential having a barrier height of 2.1 kcal/mole for each C-C bond. Parameters for the nonbonded repulsions were adjusted to reproduce the experimental energy difference E-sigma of 500 cal/mole between the gauche and the trans states. The same parameters yield barrier heights for rotations in propane, n-butane, isobutane, and neopentane which agree with experiment. The potential wells about gauche and trans minima in n-butane and n-pentane are similar in breadth. The former were found to occur at ca.phi-g = plus or minus 112.5 degrees from trans. Neighbor rotations of like sign g (plus or minus) g (plus or minus) in n-pentane are essentially unperturbed by one another. The energy of g (plus or minus) g (plus or minus) pairs of opposite sign is prohibitively large. These are superseded by pairs of shallow minima at ca. plus or minus 115, plus or minus 80 degrees and plus or minus 80, plus or minus 115 degrees with energies ca. 3.0 to 3.5 kcal/mole above tt. The mean dimensions of polymethylene chains H-(CH2)n+1-H were interpreted in light of these features of the conformation energy of first neighbor bonds in lower n-alkane homologs. The characteristic ratio and its temperature coefficient were computed for various values of the parameters involved. (Author)

AD-638 936 **Field 7C**
Not available from CFSTI.
Kentucky Univ., Lexington. Dept. of Chemistry.
THE STEREOCHEMISTRY OF THE THERMALLY INDUCED ISOMERIZATION OF n-SUBSTITUTED PYRROLES.
by John M. Patterson, and L. T. Burka. 16 May 66, 1p
AROD-5551:1
Availability: Published in Journal of the American Chemical Society v88 p3671 1966.

Descriptors: (*Pyrroles, *Stereochemistry), (*Molecular isomerism, Pyrroles), Molecular rotation, Thermal properties, Free radicals.

Identifiers: Butyl pyrroles, Phenylethyl pyrroles.

The isomerization of N- (secbutyl)pyrrole to the 2 isomer occurred with retention of configuration both above and below the isokinetic temperature of 589C, at 575C, 79% retention; and at 600C, 77% retention. The migration of the phenylethyl group in (+)-N- (1-phenylethyl)pyrrole to the 2 position likewise occurred with 72% retention of configuration at 550C. The 3 isomers, 3-sec-butylpyrrole (600C experiment) and 3- (1-phenylethyl)-pyrrole, were both formed with an estimated 10% retention of configuration.

AD-638 975 **Field 7C, 11I**
CFSTI Prices: HC$3.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
HIGH MOLECULAR COMPOUNDS, 1964, VOL. 6, NO. 10: SELECTED ARTICLES.
31 May 66. 52p FTD-TT-65-757
TT-66-62246
Edited trans. of Vysokomolekulyarnye Soedineniya (USSR), v6 n10 p1755-7, 1802-5, 1814-20, 1838-43, 1852-61 1964. See also AD-620 972, AD-622 362.

Descriptors: (*Polymers, *Organic nitrogen compounds), Pyridines, Chemical bonds, Films, Electrical conductance, Polymerization, Quinolines, Complex compounds, Zinc compounds, Chlorides, Heterocyclic compounds, USSR.

Identifiers: Zinc chloride.

Contents: Conjugated double-bond polymers containing pyridine rings, by V. V. Pen'kovskiy; Investigation of the conductivity of polymer films at high frequencies, by L. I. Boguslavskiy and L. S. Stil'bans; Polymerization of quinoline complexed with zinc chloride, by D. A. Topchiyev, V. A. Kabanov and V. A. Kargin; Some aspects of the polymerization of 4-chloropyridine, by A. A. Berlin, Ye. F. Razvodovskiy and G. V. Korolev; and Kinetics and mechanism of the polymerization of aromatic heterocyclic compounds, by V. A. Kabanov, V. A. Kargin, et. al.

AD-638 996 **Field 7C**
Not available from CFSTI.
Duke Univ., Durham, N. C. Dept. of Chemistry.
PRIMARY AND SECONDARY IONIZATIONS OF ALPHA HYDROGENS OF PHENYLACETONITRILE BY n-BUTYLLITHIUM.
by Edwin M. Kaiser, and Charles R. Hauser. 21 Mar 66, 1p
Grant DA-ARO (D)-31-124-G770
AROD-3581:18
Availability: Published in Journal of the American Chemical Society v88 p2348 1966.

Descriptors: (*Acetonitriles, Ionization), Hydrogen, Metalorganic compounds, Lithium compounds, Salts, Benzenes.

Identifiers: Benzyl cyanides.

It is reported that phenylacetonitrile undergoes primary and secondary ionizations of its alpha hydrogens with n-butyllithium in tetrahydrofuran-hexane to form the mono- and dilithio salts, which may be represented as C6H5CHLiCN and C6H5CLi2CN, respectively. These ionizations were accompanied by color changes of yellow and brown, respectively.

AD-639 003 **Field 7C**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Chemistry.
CHOLESTERYL PERCHLORATE FROM CARBONIUM PERCHLORATE ION-PAIR RETURN.
by Anne Ehret, and S. Winstein. 5 Mar 66, 3p
Grant DA-ARO (D)-31-124-G642
AROD-3580:22
Availability: Published in The Journal of the American Chemical Society v88 n9 p2048-9 1966.

Descriptors: (*Cholesteryl esters, Chemical reactions), (*Perchlorates, Cholesteryl esters), Molecular isomerism, Catalysis, Perchloric acid, Reaction kinetics, Chemical equilibrium, Ions.

Identifiers: Cholesteryl perchlorate.

AD-639 005 **Field 7C**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Chemistry.
ALLYLIC OXIDATION OF OLEFINS BY PALLADIUM ACETATE.
by William Kitching, Zvi Rappoport, S. Winstein, and W. G. Young. 21 Mar 66, 3p
Grant DA-ARO (D)-31-124-G642
AROD-3580:23
Availability: Published in The Journal of the American Chemical Society v88 n9 p2054-5 May 5 1966.

Descriptors: (*Alkenes, Oxidation), (*Palladium compounds, *Acetates), Alcohols, Esters, Synthesis (Chemistry), Molecular isomerism.

Identifiers: Palladium acetate.

It is shown that in olefin-Pd (OAc)2 oxidation: (i) 1-olefins give mainly enol acetate while 2-olefins give mainly allylic acetate; (ii) 1-olefins and 2-olefins give different allylic acetates.

AD-639 008 **Field 7C**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Chemistry.
RING INVERSION, ULTRAVIOLET SPECTRUM, AND ELECTRONIC STRUCTURE OF THE MONOHOMOTROPYLIUM ION.
by S. Winstein, C. G. Kreiter, and J. I. Brauman. 14 Feb 66, 3p
Grant DA-ARO (D)-31-124-G642
AROD-3580:25
Prepared in cooperation with Stanford Univ., Calif. Dept. of Chemistry.
Availability: Published in the Journal of the American Chemical Society v88 p2047-8 1966.

Descriptors: (*Cycloalkenes, Chemical properties), Ions, Chemical reactions, Spectra (Visible + ultraviolet), Molecular orbitals, Stereochemistry, Deuterated compounds.

Identifiers: Cyclooctatetraene molybdenum carbonyls, Cyclooctatetraenes, Inversion reactions, Monohomotrophylium ions.

The nmr spectrum of the C8H9 (+) ion from protonation of cyclooctatetraene points clearly to the homoaromatic monohomotropylium structure I for this species. This is true also of its molybdenum tricarbonyl complex. A report is now given on the rate of ring inversion in the monohomotropylium ion and the free-energy difference between this nonclassical species and a classical cyclooctatrienyl cation. Further insight into the nature of I is provided by its ultraviolet spectrum in comparison with that of tropylium ion.

AD-639 070 **Field 7C**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Chemistry.
MACRO RINGS. XXXIII. A 1,6 TO 1,6 CYCLOADDITION REACTION, A DIELS-ALDER INSERTION REACTION, AND BENT BENZENE RINGS.
by Donald J. Cram, Carroll S. Montgomery, and Graham R. Knox. 9 Aug 65, 12p
AROD-3632:11
Availability: Published in The Journal of the American Chemical Society v88 n3 p515-25 Feb 5 1966.

Descriptors: (*Polycyclic compounds, Chemical reactions), (*Stereochemistry, Polycyclic compounds), (*Diene synthesis, Polycyclic compounds), Benzenes, Reaction kinetics, Ketones, Furans, Alcohols, Organic sulfur compounds, Spectra (Infrared), Spectra (Visible + ultraviolet), Nuclear magnetic resonance.

Identifiers: Paracyclophanes.

A method for the synthesis of (8)paracyclophane was developed, based on the 1,6 to 1,6 cycloaddition reactions of Winberg, et al. (JACS v82 p1428 1960). This approach also provided compounds useful for an extension of studies of carbonium ions generated in the face of benzene rings, and for an examination of the course and stereochemistry of a unique multiple Diels-Alder reaction.

AD-639 079 **Field 7C**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Chemistry.
ELECTROPHILIC SUBSTITUTION AT SATURATED CARBON. XXV. STRUCTURAL REQUIREMENTS FOR FUNCTIONAL GROUPS CENTERED AROUND SECOND-ROW ELEMENTS TO PRESERVE ASYMMETRY OF CARBANIONS.
by Donald J. Cram, Robert D. Trepka, and P. St Janiak. 22 Nov 65, 12p
AROD-3632:10
See also AD-629 641.
Availability: Published in The Journal of the American Chemical Society v88 n12 p2749-59 Jun 20 1966.

Descriptors: (*Substitution reactions, *Stereochemistry), Hydrogen, Deuterium, Exchange reactions, Reaction kinetics, Molecular rotation, Molecular orbitals, Organic sulfur compounds, Organic phosphorus compounds, Organic nitrogen compounds, Ions.

The stereochemical course of base-catalyzed hydrogen-deuterium exchange at asymmetric carbon was examined in six new systems in which the intermediate carbanion is stabilized by different functional groups centered about second-row elements. The first three systems, n-C6H13 (CH3)C*HSO2N (CH3)C6H5, n-C6H13 (CH3)C*HSO2OCH3, and n-C6H13 (CH3)C*HPO2 (-) (C6H3), gave values of k (e)/k (alpha) (rate constant for isotopic exchange over rate constant for racemization) that ranged from 37 to 17 in t-butyl alcohol-O-d-potassium t-butoxide. The first system (deuterated) gave k (e)/k (alpha) values of 34 and 17 in dimethyl sulfoxide-methanol and in ethylene glycol-potassium ethylene glycoxide. In contrast, the second three systems, n-C6H13 (CH3)C*HSO2NC6H5, n-C6H13 (CH3)C*HSO3, (-) and n-C6H13 (CH3)C*HPO (OC2H5)2, gave k (e)/k (alpha) values close to unity (1.1 to 2.9). These results coupled with those obtained previously with 2-octyl phenyl sulfone, 2-octyl phenyl sulfoxide, and 2-octyldiphenylphosphine oxide provide the following generalizations. Functional groups centered around second-row elements that bear two charge-carrying negative elements induce asymmetry in attached carbanions. Functional groups centered around second-row elements that bear one or three charge-carrying negative elements do not induce asymmetry in attached carbanions. (Author)

AD-639 138 **Field 7C, 6A**
Not available from CFSTI.
Prairie Regional Lab., Saskatoon (Saskatchewan).
GAS-LIQUID CHROMATOGRAPHY OF TERPENES. XIV. THE CHEMICAL COMPOSITION OF THE VOLATILE OIL OF THE LEAVES OF PICEA RUBENS SARG. AND CHEMOTAXONOMIC CORRELATIONS WITH OTHER NORTH AMERICAN SPRUCE SPECIES.
by E. von Rudloff. 7 Aug 65, 11p
NRC-8890
Availability: Published in Phytochemistry v5 p331-41 1966.

Descriptors: (*Terpenes, Chromatographic analysis), (*Trees, Terpenes), Gas chromatography, Classification, Tissue extracts, Oils, Biosynthesis, Canada.

Identifiers: Picea rubens, Taxonomy.

The volatile oil from two populations of red spruce was found to consist mainly of bornyl acetate (55 per cent). Smaller amounts of alpha-and-beta-pinene, camphene, 3-carene, myrcene, limonene, alpha-and-beta-phellandrene, p-cymene, 1:8-cineole, linalool, camphor, terpinen-4-ol, alpha-terpineol, borneol, piperitone, citronellyl and geranyl acetate, bisabolene and a mixture of gamma and delta-cadinene ('canadene') were also isolated. Santene, tricyclene gamma-terpinene, thujone, isothujone and isoborneol were tentatively identified. The leaf oils of the foliage from black spruce (2 trees) white spruce (3 trees) and Colorado spruce (5 trees) were analysed by GLC and the data obtained were compared with those of red spruce. The close phylogenetic relationship of red and black spruce was found to be reflected in the chemical composition of their leaf oils, whereas significant chemical differences were observed with both white and Colorado spruce. Hypothetical pathways for the formation of the terpenes found in spruce leaf oils from a single precursor, such as geranyl pyrophosphate, are discussed. Piperitone, a C-3 oxygenated monoterpene, appears to take an exceptional position in such postulated sequences. Also, not all of the compounds expected from schemes involving carbonium-ion intermediated are found in the spruce leaf oils. (Author)

AD-639 139 **Field 7C, 11I**
Not available from CFSTI.
National Research Council of Canada, Ottawa (Ontario). Div. of Applied Chemistry.
THE POLYMERIZATION OF STYRENE BY ANHYDROUS PERCHLORIC ACID AND THE SPECTRA OF BENZYLIC CARBONIUM IONS.
by S. Bywater, and D. J. Worsfold. 24 Mar 66, 7p
NRC-9048
Availability: Published in Canadian Journal of Chemistry v44 p1671-6 1966.

Descriptors: (*Styrenes, Polymerization), (*Polymerization, *Catalysis), Perchloric acid, Catalysts, Spectroscopy, Ions, Reaction kinetics, Styrene plastics, Preparation, Canada.

A spectroscopic investigation of the reaction of anhydrous perchloric acid with styrene in methylene chloride solution was carried out, together with a study of the spectra of styrene and its derivatives dissolved in sulfuric acid. From the results it was decided that the absorbing species formed at the end of the reaction in methylene chloride are derivatives formed from the cyclized end groups of the polymer chain, and not the polystyrylcarbonium ion. It is not thought possible to determine from spectroscopic studies whether the polymerization reaction goes via a true ionic intermediate or a perchlorate ester. (Author)

AD-639 338 **Field 7C**
Not available from CFSTI.
Wetherill Chemistry Labs., Purdue Univ., Lafayette, Ind.
SELECTIVE REDUCTIONS. IX. REACTION OF LITHIUM ALUMINUM HYDRIDE WITH SELECTED ORGANIC COMPOUNDS CONTAINING REPRESENTATIVE FUNCTIONAL GROUPS. X. REACTION OF ALUMINUM HYDRIDE WITH SELECTED ORGANIC COMPOUNDS CONTAINING REPRESENTATIVE FUNCTIONAL GROUPS. COMPARISON OF THE REDUCING CHARACTERISTICS OF LITHIUM ALUMINUM HYDRIDE AND ITS DERIVATES.
by Herbert C. Brown, Paul M. Weissman, and Nung Min Yoon. 3 Nov 65, 16p
Grant DA-ARO (D)-31-124-G117
AROD-1287:14
See also AD-629 470.
Availability: Published in Journal of the American Chemical Society v88 p1458-72 5 Apr 66.

Descriptors: (*Reduction (Chemistry), Organic compounds), (*Lithium compounds, Oxidation-reduction reactions), (*Aluminum compounds, Oxidation-reduction reactions), (*Hydrides, Oxidation-reduction reactions), Metalorganic compounds, Organic solvents, Reaction kinetics, Aldehydes, Ketones, Quinones, Carboxylic acids, Esters, Lactones, O-heterocyclic compounds, Amides, Nitriles, Organic nitrogen compounds, Organic sulfur compounds.

Identifiers: Lithium aluminum hydride, Aluminum hydrides.

The first paper reports the results of a systematic examination of the reaction of lithium aluminum hydride with a standard list of 56 organic compounds, containing representitive functional groups, under standardized conditions. The second paper reports the results of a similar study involving aluminum hydride. The reactions of LiAlH4 and AlH3 are compared to each other, and to results previously obtained with lithium trimethoxy-aluminum hydride and with lithium trit-butoxyaluminohydride. In addition, a simple and convenient method for the preparation of AlH3-tetrahydrofuran solutions is given.

AD-639 344 **Field 7C**
Not available from CFSTI.
Wisconsin Univ., Madison. Dept. of Chemistry.
BREDT RULE INTERDICTIONS OF CYCLOPROPANE REARRANGEMENTS. THE VINYLNORTRICYCLENES.
by Jerome A. Berson, and M. Robert Willcott. 29 Mar 65, 4p
Grant DA-ARO (D)-31-124-G497
AROD-3921:1
Availability: Published in Journal of Organic Chemistry v30 p3569-72 Oct 1965.

Descriptors: (*Cyclopropanes, Stereochemistry), (*Terpenes, *Stereochemistry), Polycyclic compounds, Molecular orbitals, Molecular energy levels.

Identifiers: Vinyl nortricyclenes.

AD-639 408 **Field 7C**
Not available from CFSTI.
New Hampshire Univ., Durham. Dept. of Chemistry.
SYNTHESIS OF SOME ALKYLIDENECYCLOPROPANES FROM ALLENES.
by W. Rahman, and Henry G. Kuivila. 24 Aug 65, 6p
Grant DA-ARO (D)-31-124-G587
AROD-5348:1
Prepared in cooperation with State Univ. of New York, Albany.
Availability: Published in Journal of Organic Chemistry v31 p772-6 1966.

Descriptors: (*Cyclopropanes, Synthesis (Chemistry)), Dienes, Bromine compounds, Halogenated hydrocarbons, Reduction (Chemistry), Spectra (Infrared), Nuclear magnetic resonance.

Identifiers: Alkylidene cyclopropanes.

2,2-Dibromoalkylidenecyclopropanes were prepared by the addition of dibromocarbene to allenes. The dibromo derivatives were reduced successively to the monobromides and the hydrocarbons. Infrared and proton magnetic spectra of the adducts and their dehalogenation products are discussed. (Author)

AD-639 498 **Field 7C**
CFSTI Prices: HC$1.00 MF$0.50
Olin Mathieson Chemical Corp., New Haven, Conn. Chemical Div.
SOME TERTIARY ALCOHOLS DERIVED FROM m-CARBORANE.
Technical rept.
by Clayton Obenland, and Stelvio Papetti. Sep 66, 8p TR-32
Contract Nonr-3395 (00)
Proj. NR-356-431

Descriptors: (*Organoboranes, *Alcohols), Fluorine compounds, Chlorine compounds, Glycols, Ketones, Chemical reactions.

Identifiers: Carboranes, Carboranyl carbinols.

A report is given of the preparation of several tertiary diols of m-carborane, such as B10H10C2 (C (CH3)2OH)2 and their fluorinated derivatives such as B10H10C2 (C (CF3)2OH)2. These were prepared by reaction of the dilithio salt of m-carborane with the appropriate ketone. The following compounds were prepared - M-carboranyl-1,7-bis (dimethylcarbinol); m-carboranyl-1,7-bis (methyl trifluoromethyl carbinol); m-carboranyl-1,7-bis (di-trifluoromethyl carbinol); m-carboranyl-1,7-bis (chloro difluoromethyl trifluoromethyl carbinol).

N66-24917 **Field 7C**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
CHEMICAL REACTIONS ON THE SURFACES OF GLASS FIBERS USED IN GLASS-REINFORCED PLASTICS.
Khimicheskiye Reaktsii Na Poverkhnosti Steklyannykh Volokon, Primenyayemykh Dlya Izgotovleniya Stekloplastikov
by A. M. Poymanov, A. V. Skorova, and YE. B.Trostyanskaya. Apr 66, 15p NASA-TT-F-10099
Transl. Into English From Plasticheskie Massy (Moscow), No. 11, 1965 P 67-69

Descriptors: Chemical, *Chemical reaction, Fiber, *Filler, Glass, *Glass fiber, Hydroxyl, Interaction, Ion, Plastic, Reaction, *Reinforced plastic, Reinforcement, Resistance, U.s.s.r., Water.

For abstract, see S 04 13.

N66-26124 **Field 7C**
CFSTI Prices HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
EXPERIMENTAL PROCEDURES FOR MOLECULAR WEIGHT DETERMINATION BY LIGHT SCATTERING.
by W. H. Beattie, R. K. Laudenslager, and J. Moacanin. 1 Jan 66, 73p NASA-CR-74997, JPL-TM-33-242
Contract NAS7-100

Descriptors: Chemistry, Determination, Index, Intensity, Light, *Light scattering, Molecular, *Molecular weight, *Photometer, Polymer, *Polymer chemistry, Polystyrene, Refraction, Scattering, Weight.

For abstract, see S 04 14.

N66-26719 **Field 7C**
CFSTI Prices HC$2.00 MF$0.50
Glasgow Univ. (Scotland).
STUDIES IN RING EXPANSION.

by G. L. Buchanan. 31 Dec 64, 35p SR-2, AD-628733
Contract AF-EOAR-63-36

Descriptors: Alkaloid, Chemical, Chemistry, Colchicine, Compound, Cyclic, Ester, Infrared, Ketone, Organic, *Organic chemistry, Reaction, Ring, *Ring structure, Spectrum, Structure, *Synthesis, System.

For abstract, see S 04 14.

N66-26868 **Field 7C**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
IMMUNOADSORBENTS - PREPARATION AND USE OF CELLULOSE DERIVATIVES.
by D. H. Campbell, and N. Weliky. 1 May 66, 22p NASA-CR-75272, JPL-TR-32-900
Contract NAS7-100

Descriptors: Adsorbent, *Antibody, *Antigen, Benzene, *Biochemistry, Biology, *Blood, Bond, *Cellulose, Chemical, Protein, Serum, Solution.

For abstract, see S 04 14.

N66-34326 **Field 7C**
CFSTI Prices HC$2.50 MF$0.50
Mellon Inst., Pittsburgh, Pa.
PHYSICAL PROPERTIES OF AROMATIC HYDROCARBONS. PART II - SOLIDIFICATION BEHAVIOR OF 1-3-5 TRI-ALPHA-NAPHTHYLBENZENE.
by J. H. Magill, and D. J. Plazek. 1966, 52p NASA-CR-77301
Grant NSG-147

Descriptors: *Aromatic compound, Aromatics, Benzene, Compound, Crystal, *Crystal growth, Crystallization, Flow, Growth, Hydrocarbon, Kinetics, *Solidification, Temperature, Viscous.

For abstract, see S 04 20.

N66-34429 **Field 7C**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
ELECTROLYTE SOLVENT PROPERTIES OF ORGANIC SULFUR DERIVATIVES.
by R. E. Johnson. Aug 66, 16p NASA-TM-X-1283
Contract 123-34-01-09-22

Descriptors: Aliphatic, Aromatics, Arsenic, *Battery, Chemical, Compound, Derivative, Electrochemical, Organic, *Organic compound, Phosphorus, Property, Reaction, *Solvent, Sulfur, *Sulfur compound.

For abstract, see S 04 20.

N66-34629 **Field 7C**
CFSTI Prices HC$1.00 MF$0.50
lifornia Univ., Berkeley.
HIGH RESOLUTION MASS SPECTROMETRY IN MOLECULAR STRUCTURE AND STEREOCHEMICAL STUDIES - EFFECT OF STEREOCHEMISTRY ON THE FRAGMENTATION OF EPIMERIC DERIVATIVES OF AZABICYCLOALKANES.
by A. L. Burlingame, H. K. Schnoes, and D. H. Smith. 1966, 11p NASA-CR-77309
Grant NSG-101
Submitted For Publication

Descriptors: *Alkane, Fragmentation, High resolution, Mass, *Mass spectrometry, Molecular, Spectrometry, Spectrum, *Stereochemistry, Structure.

For abstract, see S 04 20.

N66-35178 **Field 7C**
CFSTI Prices HC$1.00 MF$0.50
Temple Univ., Philadelphia, Pa.
IMPROVED PREPARATION OF 9-OCTADECENES.
by M. E. Dyen, H. C. Hamann, and D. Swern. 1966, 10p NASA-CR-77468
Grant NSG-/T/-140, Contract PHS CA-07803
Submitted For Publication

Descriptors: Alcohol, *Alkene, Aluminum, Chemical, *Chemical reaction, Compound, Hydride, *Hydrocarbon, Improvement, Lithium, *Lithium aluminum hydride, Octane, Oleic, Organic, *Organic compound, Reaction, Reduction.

For abstract, see S 04 20.

AD-638 715 **See Field 7D**

AD-638 716 **See Field 7D**

AD-638 951 **See Field 7E**

AD-639 000 **See Field 7E**

AD-639 270 **See Field 7E**

AD-639 442 **See Field 111**

AD-639 581 **See Field 111**

7D. PHYSICAL CHEMISTRY

AD-484 604 **Field 7D**
CFSTI Prices: HC$2.00 MF$0.50
Hercules Research Center, Wilmington, Del.
A STUDY OF THE ELECTRONIC CONFIGURATION AND BEHAVIOR OF THE -NF2 GROUP.
Quarterly rept. no. 13, Mar-May 66.
by Alan D. Craig. 27 Jun 66, 42p HRC-66-2
Contract DA-31-124-ARO (D)-62, ARPA order-402
Proj. ARO-D-4136-C
Task 2
See also AD-630 945.

Descriptors: (*Fluoroamines, Reaction kinetics), Spectra (Infrared), Deuterated compounds, Molecular orbitals, Band spectrum, Vibration, Quantum mechanics, Matrix algebra, Polarographic analysis, Reduction (Chemistry), Ions, Hydroxides, Buffers, Phosphates, Borates, Ammonium compounds, Chlorides, Sodium compounds, Methanols, Bromides, Acetates, Dipole moments.

The purpose of the research is to learn more of the chemistry of compounds containing the NF2 group and to look for new ions and compounds in the area of N-F chemistry. Efforts were concentrated on making a comparison of the energy of the lowest available sigma orbital with the corresponding polarographic reduction potential, on analysis of the fine structure of vibrational spectra, and on the kinetics of the reactions of anions with difluoramine. Efforts were continued in dipole moment measurements, mass spectrometry, and magnetic resonance. Particular emphasis is currently placed on reaction mechanisms.

AD-638 706 **Field 7D**
Not available from CFSTI.
Cornell Univ., Ithaca, N. Y.
THEORETICAL FITTING OF THE ARGON K ABSORPTION SPECTRUM ON A ONE-ELECTRON MODEL.
Revised ed.
by Takeshi Watanabe. 10 May 65, 7p
Contract AF 49 (638)-402
Proj. AF-9761
Task 976103
AFOSR-66-1486
Revision of manuscript submitted 29 Jul 64. Supported in part by NSF.
Availability: Published in Physical Review v139 n6A pA1747-51 Sep 13 1965.

Descriptors: (*X-ray spectroscopy, Argon), (*Argon, X-ray spectrum), (*Electron transitions, Argon), Absorption spectrum, Atomic energy levels, Mathematical models, Ionization, Fluorescence.

The one-electron model was used to analyze the argon K absorption spectrum near the K edge. It was assumed that the absorption spectrum consists of (1) two Lorentzians due to 1s to 4p and 1s to 5p resonant transitions, (2) a modified arctangent to account for the 1s to np (n> or = 6) and the 1s to continuum transitions, and (3) a constant background due to the L, M ionizations. The transmission spectrum containing adjustable parameters was constructed on the one-electron model and was then smeared by the experimental window function. The values of these parameters were selected to minimize the x sq. value between the observed transmission curve and the smeared-model transmission curve. The criterion showed that the present model fits the observed curve. Pertinent parameters were interpreted in terms of oscillator strengths and the K-state width. The oscillator strengths (0.00217 and 0.00066) of the 1s to 4p and 1s to 5p transitions show fair agreement with the theoretical values (0.00166 and 0.00053). The K-state width parameter is 0.68eV, which compares well with the value obtained by several different spectral methods as well as the value obtained from the K fluorescence yield. (Author)

AD-638 710 **Field 7D**
Not available from CFSTI.
Philips Labs., Briarcliff Manor, N. Y.
ESCAPE PEAK INTERFERENCES IN X-RAY POWDER DIFFRACTOMETRY.
by W. Parrish. 1963, 19p Contrib-227
Contract AF 49 (638)-1234
AFOSR-66-1844
Availability: Published in Advances in X-ray Analysis v8 p118-33.

Descriptors: (*X-ray diffraction analysis, Powder metals), Fluorescence, Absorption, Energy, Pulse height analyzers.

Escape peaks occur when the incident X-ray quantum energy exceeds the absorption edge energy of the detector element and the resulting X-ray fluorescence is lost from the detector. The most common escape peaks result from I K-fluorescence in NaI-scintillation counters and XeK-, XeL-, and KrK-fluorescence in proportional counters. The average pulse amplitude of the escape peak is proportional to the difference of the energies of the incident and fluorescent X-rays. If the intensity of the escape peak is high as in the case of MoK sub alpha and a kryptonproportional counter, and the lower level of the pulse height analyzer is raised to reject the escape peak, the quantum counting efficiency may be reduced by a factor of two. When the pulse height analyzer is set for characteristic incident radiation, escape peaks appear in powder patterns at small diffraction angles. These broad low-intensity peaks are often mistakenly identified as resulting from misalignment, scattering, etc. Each powder reflection can produce its own escape peak which occurs at an angle slightly smaller than the absorption edge of the detector element. In a silicon powder pattern the three strongest reflections produce three resolved escape peaks whose peak intensities are about 4% of their corresponding CuK sub alpha peaks when the X-ray tube is operated at 50 kV. The escape peak intensities decrease with decreasing X-ray tube voltage and disappear when the voltage is lower than the absorption edge energy of the detector element. (Author)

AD-638 713 **Field 7D**
Not available from CFSTI.
Westinghouse Research Labs., Pittsburgh, Pa.
SPIN RELAXATION OF ATOMIC HYDROGEN IN FUSED SILICA: TEMPERATURE DEPENDENCE.

by D. W. Feldman, J. G. Castle Jr, and G. R. Wagner. 13 Dec 65, 6p
Contract AF 49(638)-1589
Proj. AF-9763
Task 976302
AFOSR-66-1266
Availability: Published in Physical Review v145 n1 p237-40 May 6 1966.

Descriptors: (*Relaxation time, *Hydrogen), (*Silicon compounds, Hydrogen), Dioxides, Temperature.

An unusual temperature dependence has been found for the spin-lattice relaxation time T sub 1 of the hydrogen atoms trapped in fused silica; 1/T sub 1 is found to vary strongly with temperature in the range between 2 and 20K and to approach proportionality to T above 20K. After removal of some of the hydrogen centers by thermal annealing, the relaxation is slower but has essentially the same temperature dependence. The data are interpreted in terms of a localized resonance mode of vibration having a large temperture-independent amplitude in the neighborhood of the hydrogen spin. The model proposed by Murphy fits the data accurately over four decades in T sub 1 with a characteristic frequency of 2.8 (10 to the 11th power)cps. (Author)

AD-638 715 **Field 7D, 11I, 7C**
Not available from CFSTI.
Explosives Research and Development Establishment, Waltham Abbey (England).
THE POLYMERISATION OF CAPROLACTAM. I. EQUILIBRIUM STUDIES ON THE SYSTEM CAPROLACTAM/HEXAMETHYLENEDIAMINE/POLYCAPRAMIDE.
by F. W. S. Carrer, and B. L. Hollingsworth. 4 Jun 65, 11p WAC/172/026, Offprint-66/9
Availability: Published in Makromolekulare Chimie v95 p135-42 1966.

Descriptors: (*Polyamide plastics, Polymerization), (*Polymerization, Chemical equilibrium), Concentration (Chemistry), Catalysts, Amines, Thermochemistry, Heat of reaction, Entropy, N-heterocyclic compounds, Great Britain.

Identifiers: Hexahydro azepinones, Triethylene diamines.

Limiting equilibrium concentrations of caprolactam of 5.4% and 7.5% at 220C and 250C were obtained in the system caprolactam/hexamethylenediamine/polycapramide. The heat of reaction, the entropy change for the lactam addition reaction, and the ceiling temperature are similar to those obtained for water-initiated caprolactam polymerisation. The theoretical calculations of Tobolsky and Eisenberg on the amine-initiated system were confirmed experimentally. (Author)

AD-638 716 **Field 7D, 7C**
Not available from CFSTI.
Explosives Research and Development Establishment, Waltham Abbey (England).
THE THERMAL DECOMPOSITION OF SOME ORGANIC SOLIDS. PART II. m-NITROPEROXYBENZOIC ACID AND RELATED PEROXYACIDS.
by D. F. Debenham, and A. J. Owen. 25 Jan 66, 7p WAC-172/078, Offprint-66/10
Availability: Published in Journal of the Chemical Society, Section B Physical Organic Chemistry p675-8 1966.

Descriptors: (*Peroxides, *Pyrolysis), (*Benzoic acids, Pyrolysis), Reaction kinetics, Heat of activation, Solids, Organic compounds, Great Britain.

Identifiers: Chloro peroxybenzoic acids, Nitro peroxybenzoic acids, Peroxy toluic acids.

The thermal decomposition of m-nitroperoxybenzoic acid was studied in a static system in the temperature range 66.5-90C. m-Nitrobenzoic acid, carbon dioxide, water, and nitrogen are the principal products with dinitrodiphenyls, nitrobenzoates, and oxygen as minor products. The reaction is autocatalytic; its course may be represented by two expressions of the form log (V/V-infinity -V) = kt + C, where V-infinity is the volume of gas evolved at complete decomposition, V, the volume of gas evolved at t minutes and k the rate constants. The activation energy for both processes is 30 plus or minus 3 kcal./mole. A reaction mechanism involving the rupture of the peroxy bond and subsequent reactions of the two radicals formed is proposed. Substituted benzoic acids and oxalic acid catalyse the decomposition. The investigation was extended to include the thermal decomposition of p-peroxytoluic acid and p-chloroperoxybenzoic acid. (Author)

AD-638 760 **Field 7D**
CFSTI Prices: HC$1.00 MF$0.50
Massachusetts Univ., Amherst. Polymer Research Inst.
A STUDY OF DYNAMIC OPTICAL PROPERTIES OF POLYMERIC SOLIDS.
Final rept., 1 Jul 63-30 Jun 66.
by Richard S. Stein. 23 Aug 66, 6p
Grant DA-ARO (D)-31-124-G469
Proj. DA-20014501B13B
AROD-4051.13

Descriptors: (*Optical properties, *Polymers), (*Dynamics, Solids), Deformation, Loading (Mechanics), Crystal structure.

Structural changes accompanying the deformation of crystalline polymers have been studied by the techniques of (a) birefringence, (b) light scattering, (c) x-ray diffraction, and (d) dichroism. These techniques have been utilized for both static and dynamic measurements. They have demonstrated that upon deforming a crystalline polymer, the initial response is a deformation of the superstructure, followed by a viscoelastic rearrangement of crystals within the deformed matrix. Dynamic mechanical behavior has been correlated with dynamic optical behavior in an effort to elucidate structural response mechanisms. (Author)

AD-638 766 **Field 7D**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Physics.
TEMPERATURE DEPENDENCE OF HYPERFINE COUPLING OF S-STATE IONS IN CUBIC ENVIRONMENT.
by E. Simanek, and R. Orbach. 16 Dec 65, 4p
Contract Nonr-233 (88)
Availability: Published in The Physical Review v145 n1 p191-4 May 6 1966.

Descriptors: (*Hyperfine structure, Temperature), Atomic orbitals, Ions, Crystals.

The experiments of Walsh, Jeener, and Bloembergen on Mn (2+):MgO exhibit a hyperfine-coupling constant A which decreases with increasing temperature, contrary to the contribution from lattice thermal expansion. This paper proposes a mechanism in which excited s-like configurations are admixed into the 3d5 configuration by the orbit-lattice interaction. The hyperfine field resulting from such admixtures is opposite to the T=O (primarily core polarization) hyperfine field. As the amplitude of phonon vibrations is thermally increased, a net decrease of A is predicted, the temperature dependence of which is in agreement with the results of Walsh et al. An estimate of the magnitude of this mechanism using a near-neighbor point-charge model falls somewhat short of the observed magnitude, but the discrepancy is shown to originate in the evaluation of the orbit-lattice coupling constant. In view of the primitive model currently used to compute these coupling constants, agreement in magnitude of the calculated and observed shift is as good as can be expected. (Author)

AD-638 767 **Field 7D, 20L, 20H**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Physics.
LOW-TEMPERATURE ELECTRIC DIPOLE VIBRONIC TRANSITIONS IN ROCKSALT- AND ZINC-BLENDE-TYPE STRUCTURES.
Revised ed.
by Lawrence A. Vredevoe. 22 Mar 66, 4p
Contract Nonr-233 (88)
Revision of manuscript submitted 6 Dec 65.
Availability: Published in The Physical Review v147 n2 p541-4 Jul 15 1966.

Descriptors: (*Low-temperature research, *Selection rules), (*Crystal lattices, Electron transitions), Rock salt, Zinc compounds, Sulfides, Vibration.

Low-temperature electric dipole vibronic transitions involving the destruction of a photon and creation of a phonon are studied in this paper. A point-charge model is used to develop an expression for the lattice-electron potential due to the long-wave acoustic modes. The intensity of the long-wavelength 'tail' of the vibronic line is found to increase as the fifth power of the absorbed-photon frequency in rocksalt-type lattices, while in zinc blende the intensity is found to be proportional to the third power of the phonon frequency. The intensities are shown to be greater for the transverse modes than for the longitudinal modes. (Author)

AD-638 772 **Field 7D**
Not available from CFSTI.
California Univ., Santa Barbara. Dept. of Physics.
SUPERCOOLING AND VAPOR SNAKE FORMATION IN XENON.
Technical note.
by H. D. Pruett, and H. P. Broida. 21 Feb 66, 2p
TR-19
Supported in part by ARPA and ONR.
Availability: Published in J. Phys. Chem. Solids v27 p1365-6 1966.

Descriptors: (*Xenon, *Supercooling), (*Vapor pressure, Xenon), Crystallization, Refrigerants.

AD-638 780 **Field 7D**
Not available from CFSTI.
Queen's Univ., Belfast (North Ireland). School of Physics and Applied Mathematics.
ION MOBILITIES IN HELIUM.
by E. C. Beaty, J. C. Browne, and A. Dalgarno. 18 Feb 66, 2p
Availability: Published in Physical Review Letters v16 n17 pD514 1-2-D514 2-2 Apr 25 1966.

Descriptors: (*Helium, Ions), (*Ions, Mobility), Mass spectroscopy, Great Britain.

AD-638 822 **Field 7D**
Not available from CFSTI.
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
APPROXIMATION TO CALCULATE EQUIVALENT WIDTH OF TWO OVERLAPPING LINES.
Physical sciences research papers.
by Hajime Sakai. 25 Jun 65, 4p AFCRL-66-444, AFCRL-PSRP-242
Proj. AF-7670
Task 767003
Availability: Published in Journal of the Optical Society of America v56 n1 p127-8 Jan 1966.

Descriptors: (*Line spectrum, Approximation (Mathematics)), Absorption spectrum.

In a recent paper, the author obtained the approximate solution useful to describe the equivalent width of two overlapping lines. G. N. Plass criticized that the error arising in our calculation of some cases for complete overlapping was rather large. Although his proposed solutions gave excellent results in a few specific cases where they were made applicable, a unified solution which can cover all cases while introducing a negligible error is more useful to this problem. This paper derives

such a general solution and discusses its merit. (Author)

AD-638 825 **Field 7D**
Not available from CFSTI.
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
CORIOLIS INTERACTION IN THE NU 1 AND NU 3 FUNDAMENTALS OF OZONE.
Physical sciences research papers.
by Shepard A. Clough, and Francis X. Kneizys.
4 Oct 65, 10p AFCRL-66-512, AFCRL-PSRP-252
Proj. AF-7670
Task 767003
Availability: Published in Journal of Chemical Physics v44 n5 p1855-61 Mar 1 1966.

Descriptors: (*Coriolis effect, *Ozone), Molecular spectroscopy, Absorption spectrum.

AD-638 830 **Field 7D, 20H**
CFSTI Prices: HC$3.00 MF$0.75
Brandeis Univ., Waltham, Mass.
CLASSICAL STATISTICAL MECHANICS OF THE HARD-CORE POTENTIAL.
by Martin J. Cooper. Jun 66, 75p
Contract Nonr-1677 (04)

Descriptors: (*Statistical mechanics, *N-body problem), Potential theory, Nuclear binding energy, Transformations (Mathematics), Fourier analysis, Hamiltonian, Gases, Spheres, Condensation.

Identifiers: Hard-core potentials.

The purpose of this work is to discuss the difficulties associated with representing the strong short ranged forces between the particles of a many-body system and to describe a method by which a more exact treatment of the N-body system becomes available without restricted domains or excluded volume regions provided that certain physical properties of the two-body scattering are retained. The method employed, that of an extended canonical point-transformation, is based on providing an equivalent nonsingular Hamiltonian which is both Hermitian and Fourier analyzable. The price of such a transformation is the introduction of non-local velocity dependent interactions between the particles. But such forms are well known in classical mechanics and can be treated in a statistical mechanical context without difficulty. This approach allows for an immediate means of analysis of the role of the hard-core interactions in a many-body system which may be treated by any of the conventional methods of statistical physics. Direct contact is made with the more usual expressions for a hard-sphere many-body system and it is explicitly demonstrated that the real advantage of this canonical reformulation of the strong interactions in terms of an equivalent momentum dependent potential lies in allowing the repulsion to be treated in the same manner as any weak long ranged interaction. (Author)

AD-638 840 **Field 7D, 7B**
Not available from CFSTI.
Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
SOLVENT EFFECTS ON THE NUCLEAR MAGNETIC RESONANCE SPECTRA OF ALUMINUM BETA-DIKETONATES.
by Robert G. Linck, and Robert E. Sievers. 26 Aug 65, 12p ARL-66-0130
Proj. AF-7023
Availability: Published in Inorganic Chemistry v5 n5 p806-13 May 1966.

Descriptors: (*Aluminum compounds, *Nuclear magnetic resonance), (*Complex compounds, Nuclear magnetic resonance), (*Ketones, Complex compounds), Solvents, Molecular association, Molecular isomerism.

Identifiers: Aluminum ketonates.

The effect of solvent upon the nuclear magnetic resonance signals of various aluminum beta-diketonates was investigated. The data are discussed in terms of the various contributions to the solvent-induced chemical shift; the agreement between calculated and observed values is satisfactory. When applied to aromatic solvents with large diamagnetic anisotropies, the analysis of the data leads to the postulate of solvation of the metal chelates along their C3 axes by molecules with donor groups; for example, nitrobenzene. Aromaticity and ring currents in acetylacetonate complexes of metal ions are discussed in terms of the solvent-induced shifts and the temperature dependence of some of the signals of the aluminum complexes. (Author)

AD-638 841 **Field 7D**
Not available from CFSTI.
Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
EXCITON SPECTRUM OF ZnO.
by Y. S. Park, C. W. Litton, T. C. Collins, and D. C. Reynolds. 4 Oct 65, 12p ARL-66-0131
Proj. AF-7885
Availability: Published in The Physical Review v143 n2 p512-9 Mar 11 1966.

Descriptors: (*Line spectrum, Zinc compounds), (*Zinc compounds, Oxides), Band theory of solids, Crystals, Absorption spectrum, Reflection, Spectra (Visible + ultraviolet), Excitation.

Identifiers: Zinc oxide.

The absorption and reflection spectra of ZnO crystals have been studied in the region of intrinsic absorption, and the data have been interpreted in terms of the wurtzite model given by Birman. Three intrinsic exciton transitions have been observed, one associated with each of the three valence bands. Several bound-exciton transitions have also been observed. The data have been analyzed, and a number of exciton parameters in ZnO are reported which are somewhat modified from those previously reported. (Author)

AD-638 843 **Field 7D**
Not available from CFSTI.
Monsanto Research Corp., Dayton, Ohio.
MICROANALYSIS OF TITANIUM BY GAS CHROMATOGRAPHY.
by Guthrie Wheeler Jr, William D. Ross, and Robert E. Sievers. 6 Dec 65, 9p
Contract AF 33 (615)-1176
Proj. AF-7023
ARL-66-0134
Availability: Published in Analytical Chemistry v38 n2 p306-9 Feb 1966.

Descriptors: (*Microanalysis, *Titanium), (*Gas chromatography, Titanium), Oxides, Chlorides.

Gas chromatography of volatile metal complexes offers a rapid and highly sensitive method for the analysis of mixtures of metals. A simple, sensitive, and selective method has been developed for the quantitative microanalysis of titanium in oxide mixtures. The sample is converted to titanium tetrachloride by reaction with carbon tetrachloride at elevated temperature followed by gas chromatographic analysis. Problems of atmospheric hydrolysis prevalent in earlier studies have been eliminated by the use of a microreactor technique in which the reactants are sealed in a small capillary, the chlorination is effected, and the reaction products are introduced directly into the carrier gas stream. Validity of the technique was verified by analysis of a standard NBS sample of bauxite (certified percentage TiO2 2.78%, found 2.75%). (Author)

AD-638 863 **Field 7D, 20J**
Not available from CFSTI.
Palmer Physical Lab., Princeton Univ., N. J.
INTENSITY-CORRELATION SPECTROSCOPY.
by M. L. Goldberger, H. W. Lewis, and K. M. Watson. 30 Sep 65, 11p
Contract AF 49 (638)-1333
Proj. AF-9751
Task 975101
AFOSR-66-0824
Prepared in cooperation with California Univ., Santa Barbara, Physics Dept. and California Univ., Berkeley.
Availability: Published in The Physical Review v142 n1 p25-32 Feb 4 1966.

Descriptors: (*Quantum mechanics, *Spectroscopy), Intensity, Correlation techniques, Band spectrum, Optical instruments.

A survey is given of techniques for spectroscopic analysis using intensity fluctuations. Particular attention is given to counting times, the role of macroscopic sources and detectors, and the electronic constraints placed on the observations. (Author)

AD-638 889 **Field 7D, 12A**
CFSTI Prices: HC$2.00 MF$0.50
Naval Radiological Defense Lab., San Francisco, Calif.
COMPARISON OF THE STEADY STATE OPERATOR OF PRIGOGINE WITH THE T-MATRIX.
by W. C. Schieve. 16 Aug 66, 48p USNRDL-TR-1057
Proj. SR-011-01-01
Task 0401

Descriptors: (*Statistical mechanics, Transport properties), (*Operators (Mathematics), *Matrix algebra), Perturbation theory, Quantum mechanics.

Identifiers: Prigogine's operator, T-matrix.

Using their general perturbation methods for solving the Liouville equation, the Prigogine group has derived a transport operator, i psi (+io). By means of this operator a generalized transport equation governing the dynamic aspects of transport phenomena may be formed. It is the purpose here to compare the results of this with those obtained by means of a generalized gain-loss equation formed with the T-matrix. The latter is governed by the Lippman-Schwinger equation of scattering theory. This gain-loss equation has been used heuristically in practical calculations of transport coefficients. It is of particular interest to compare the two methods in the lambda 4th order of perturbation theory where Prigogine's irreducibility condition enters seriously for the first time. (Author)

AD-638 939 **Field 7D**
Not available from CFSTI.
Cornell Univ., Ithaca, N. Y. Dept. of Chemistry.
CRITICAL OPALESCENCE OF THE POLYSTYRENE-CYCLOHEXANE SYSTEM: SMALL-ANGLE X-RAY SCATTERING.
by P. Debye, J. Bashaw, B. Chu, and D. M. Tan Creti. 7 Feb 66, 4p
AROD-4089:10
Prepared in cooperation with Kansas Univ., Lawrence. Dept. of Chemistry.
Availability: Published in The Journal of Chemical Physics v44 n11 p4302-5 1 Jun 1966.

Descriptors: (*Styrenes, Optical properties), Polymers, Solutions, Cyclohexanes, X rays, Scattering.

Identifiers: Critical opalescence.

The critical opalescence of polystyrene-cyclohexane mixtures was studied by means of small-angle x-ray scattering for polystyrene samples of molecular weight 118 000 and 147 000. The upper limit of s/Lambda was extended to 0.025A approximately 50 times greater than the upper limit accessible to visible light. At large values of s/Lambda, plots of the reciprocal of the intensity vs (s/Lambda) sq. showed downward curvature. The experimental results can be represented by I = (1/ (A ;B (s/Lambda)sq)) + C. The magnitude of the ratio of the two terms in the expression representing

the intensity is consistent with the conclusion that the constant term C represents the scattering from density fluctuations, and the angular distribution of the scattering caused by concentration fluctuations is accurately represented by (1/ (A + B (s/ Lambda)sq)) over the range of s/Lambda investigated for the polystyrene-cyclohexane system. However, this is not true for mixtures of ordinary liquids for which the constant term is much too large to be interpreted as a density scattering term. (Author)

AD-638 944 **Field 7D, 7B**
Not available from CFSTI.
Rome Univ. (Italy).
DISSOCIATION ENERGY OF THE GASEOUS AlP MOLECULE.
by G. De Maria, K. A. Gingerich, L. Malaspina, and V. Piacente. 7 Oct 65, 2p
Research supported in part by AF-EOAR.
Availability: Published in The Journal of Chemical Physics v44 n6 p2531-1 15 Mar 1966.

Descriptors: (*Aluminum compounds, Dissociation), (*Phosphides, Dissociation), Thermochemistry, Diatomic molecules, Mass spectrum, Chemical bonds, Heat of reaction, Vapors, Molecular beams, Italy.

Identifiers: Aluminum phosphide, Heat of dissociation.

AD-638 946 **Field 7D, 7B**
Not available from CFSTI.
Rome Univ. (Italy).
TETRACARBIDE MOLECULES IN THE VAPOR PHASE OVER RARE-EARTH-GRAPHITE SYSTEMS.
by G. Balducci, A. Capalbi, G. de Maria, and M. Guido. 25 Jun 65, 2p
Research supported in part by AF-EDAR.
Availability: Published in The Journal of Chemical Physics v43 n6 p2136-7 15 Sep 1965.

Descriptors: (*Rare earth compounds, *Carbides), Vapors, Rare earth elements, Graphite, Chemical equilibrium, Cerium compounds, Holmium compounds, Praseodymium compounds, Thermochemistry, Heat of reaction, High-temperature research, Mass spectrum, Italy.

Identifiers: Cerium tetracarbide, Holmium tetracarbide, Praseodymium tetracarbide.

During the course of a mass-spectrometric study of some rare-earth-carbon systems at high temperature, it was possible to identify unambiguously not only gaseous dicarbides, but also tetracarbide molecules of high stability over the cerium-graphite and holmium-graphite systems. The PrC4 molecule was tentatively identified over the praseodymium-graphite system. (Author)

AD-638 947 **Field 7D, 7B**
Not available from CFSTI.
Rome Univ. (Italy).
MASS-SPECTROMETRIC STUDY OF THE YTTRIUM-CARBON SYSTEM.
by G. De Maria, M. Guido, L. Malaspina, and B. Pesce. 10 Aug 65, 7p
Research supported in part by AF-EOAR.
Availability: Published in The Journal of Chemical Physics v43 n12 p449-52 15 Dec 1965.

Descriptors: (*Yttrium, Mass spectrum), (*Carbon, Mass spectrum), Yttrium compounds, Carbides, Vapors, Chemical equilibrium, Chemical bonds, Thermochemistry, Heat of formation, High-temperature research, Italy.

Identifiers: Yttrium dicarbide.

A high-temperature investigation of the vapor in thermodynamic equilibrium with Y-C condensed system was carried out in the temperature range 2075-2340K. Y and YC2 are shown to be important species in the vapor phase. Utilizing the pressure-independent reaction Y (g) + 2C (s) to YC2 (g), second- and third-law methods yielded 155 plus or minus 6 kcal/mole and 156 plus or minus 5 kcal/mole, respectively, for the Y-C2 bond energy. An estimated heat of formation -27 plus or minus 6 kcal/mole for solid dicarbide is also obtained. Comparison between Me-C2 and Me-O bond strengths is made for Group IIIA elements and for the first two elements of the lanthanide series. (Author)

AD-638 966 **Field 7D**
Not available from CFSTI.
National Bureau of Standards, Washington, D. C.
HIGH-TEMPERATURE MICROWAVE SPECTROSCOPY: AlF AND AlCl.
by David R. Lide Jr. 14 Sep 64, 8p
Proj. AF-9713
Task 971302
AFOSR-66-1096
Availability: Published in Journal of Chemical Physics v42 n3 p1013-8 Feb 1 1965.

Descriptors: (*Aluminum compounds, *Microwave spectroscopy), Fluorides, Chlorides, Vapors, High-temperature research, Electron transitions, Molecular properties, Chemical bonds, Molecular orbitals, Spectrum analyzers.

Identifiers: Aluminum chlorides, Aluminum fluorides.

Microwave transitions of gaseous AlF and AlCl were studied in a high-temperature spectrometer. The molecular constants obtained for AlF are: Be=16 562.56 Mc/sec, alpha-e=148.40 Mc/sec, re=1.65437 A, (eqQ)Al=-37.6 Mc/sec, mu=1.53 D; for Al35Cl: Be=7312.74 Mc/sec, alpha-e=48.03 Mc/sec, re=2.12983 A, (eqQ)Al=-29.2 Mc/sec, (eqQ)Cl=-8.8 Mc/sec; for Al37Cl: Be=7140.69 Mc/sec, alpha-e=46.34 Mc/sec. The nature of the bonding in aluminum halides is discussed; it is concluded that the bonds are highly ionic and that the Al orbitals are sp hybrids. The details of the high-temperature spectrometer are given. (Author)

AD-639 023 **Field 7D, 7B, 8G**
Not available from CFSTI.
Chicago Univ., Ill.
THE ENTHALPY OF FORMATION OF KYANITE (Al2SiO5).
by J. L. Holm, and O. J. Kleppa. 17 Nov 65, 1p
Grant DA-ARO (D)-31-124-G616
AROD-5107:2
Availability: Published in Inorganic Chemistry v5 p698 1966.

Descriptors: (*Silicates, *Thermochemistry), (*Minerals, Thermochemistry), Aluminum compounds, Heat of formation, Enthalpy, Corundum, Quartz, Calorimetry.

Identifiers: Kyanite.

Yokokawa and Kleppa (Inorg. Chem. v3 p954 1964; J. Phys. Chem. v68 p3246 1964) reported the development of new solution-calorimetric methods at high temperature. In order to illustrate the potential of these methods as applied to the thermochemistry of the silicates, attention was given to the mineral kyanite (Al2SiO5). A new value was obtained for the enthalpy of formation of kyanite from its component oxides: -2.37 plus or minus 0.15 kcal/mole.

AD-639 196 **Field 7D, 20H**
CFSTI Prices: HC$2.00 MF$0.50
New York Univ., N. Y. Dept. of Physics.
ABSOLUTE MEASUREMENTS OF TOTAL CROSS SECTIONS FOR THE SCATTERING OF LOW-ENERGY ELECTRONS BY ATOMIC AND MOLECULAR OXYGEN.
Technical rept.
by Gabriel Sunshine, Bertrand B. Aubrey, and Benjamin Bederson. 1 Sep 66, 39p
Contract Nonr-285 (60)

Descriptors: (*Electrons, Scattering), (*Oxygen, Electron bombardment), Atoms, Molecular beams, Electron beams, Recoil atoms, Probability, Atomic orbitals, Transport properties.

Identifiers: Particle interactions.

The atom beam recoil technique was used to measure absolute total cross sections for the scattering of electrons by atomic and molecular oxygen at 22 energies between 0.5 and 11.3 eV, with additional data obtained up to 100 eV. In this method a modulated electron beam cross-fires an atom beam, whose attenuation at the modulation frequency is observed. The angular resolution in the electron polar scattering angle ranges from about 15.6 degrees at 1 eV to 9.6 degrees at 12 eV, for O, and from about 18.5 degrees at 1 eV to 11.4 degrees at 12 eV, for O2. Our absolute values for O2 between 0.5 and 11.3 eV are between 10 and 20% higher than those of Bruche, while the shape of the curve agrees well. The atomic cross sections vary from about 5.3 sq. A at 0.5 eV to 8.3 sq. A at 11.3 eV, with an estimated error of 20% except for the 0.5 eV point which has an error of 30%. These results are in excellent agreement with semi-empirical calculations of Cooper and Martin and Robinson and Geltman, as well as with the polarized orbitals calculation of Temkin. (Author)

AD-639 218 **Field 7D, 8J**
CFSTI Prices: HC$2.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
INTERFACIAL WATER STRUCTURE: THE ELECTRICAL CONDUCTIVITY OF AQUEOUS ELECTROLYTE PERMEATED PARTICULATE SOLIDS UNDER HYDROSTATIC PRESSURE.
Technical rept.
by R. A. Horne, A. F. Day, R. P. Young, and N. T. Yu. 30 Sep 66, 32p TR-23
Contract Nonr-4424 (00)
Proj. NR-051-460

Descriptors: (*Water, *Molecular association), Electrolytes, Solutions, Electrical conductance, Temperature, Pressure, Concentration (Chemistry), Surfaces, Sea water, Potassium compounds, Chlorides.

Identifiers: Surface chemistry.

Comparison of the temperature and pressure dependencies of the relative electrical conductivity of aqueous 0.10M KCl solutions and particulate solids permeated with these solutions shows that the water near an interface is structured and that this structured region tends to exclude electrolyte thereby increasing the concentration of the solution at some greater distance from the interface - a conclusion confirmed by simple elution experiments. This water structure near interfaces is more stable with respect to both temperature and pressure and thus presumably different from the structure in bulk liquid water. Two water structural forms are proposed: the one forms the substance of the Frank-Wen clusters, the hydration atmospheres of ions, and polar groups; the second forms the substance of water structure near interfaces, the hydration atmosphere of hydrophobic groups and materials including the quaternary amine ions, and the hydration crust of the hydrophobic segments of biopolymers. (Author)

AD-639 219 **Field 7D, 8J**
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
THE TOTAL SOLVATION ATMOSPHERES OF THE ALKALI METAL CATIONS IN AQUEOUS SOLUTION.
Technical rept.
by R. A. Horne, and J. D. Birkett. 30 Sep 66, 14p TR-24
Contract Nonr-4424 (00)
Proj. NR-051-460

Descriptors: (*Water, *Molecular association), (*Alkali metals, Solutions), Electrolytes, Heavy water, Electrical conductance, Electrochemistry, Lithium, Sodium, Surfaces, Sea water.

Identifiers: Surface chemistry.

Estimates of the total number of water molecules in the hydration atmospheres of the alkali metal cations based on the cationic isotope effect on conductance, the ratio of the limiting conductances, and the H2O-D2O isotope effect on conductance give values in agreement with the earlier estimate based on the minimum in the concentration dependence of the Arrhenius activation energy of viscous flow. (Author)

AD-639 220 **Field 7D, 8J**
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
HYDROPHOBIC HYDRATION.
Technical rept.
by R. A. Horne. 30 Sep 66, 7p TR-25
Contract Nonr-4424 (00)
Proj. NR-051-460

Descriptors: (*Water, *Molecular association), (*Alkali metals, Solutions), (*Ammonium compounds, Solutions), Surfaces, Viscosity, Electrolytes, Sea water.

Identifiers: Surface chemistry.

The dependence of the viscosity B-coefficients on ionic radii shows that the hydration of alkali metal cations and the tetraalkylammonium ions are fundamentally different, the former hydration being coulombic and the latter hydrophobic. (Author)

AD-639 262 **Field 7D, 7B**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md. Dept. of Chemistry.
FAR-INFRARED SPECTRA OF MATRIX-ISOLATED HYDROGEN FLUORIDE.
by D. W. Robinson, and W. G. Von Holle. 18 Oct 65, 3p
Contract AF 49 (638)-1430
Proj. AF-9710
Task 971003
AFOSR-66-1619
Availability: Published in The Journal of Chemical Physics v44 n1 p410 Jan 1 1966.

Descriptors: (*Hydrogen compounds, Spectra (Infrared)), (*Fluorides, Spectra (Infrared)), (*Infrared spectroscopy, Solid solutions), Absorption spectrum, Solidified gases, Helium group gases.

Identifiers: Matrix isolation techniques, Hydrogen fluoride.

Infrared spectra were examined of matrix isolated hydrogen fluoride at a molar concentration of 0.5 mole per cent mixed with neon, argon, krypton and xenon on a crystalline quartz window cooled with liquid helium. The data were analysed but further work is necessary before a satisfactory quantitative explanation can be found.

AD-639 264 **Field 7D, 20D**
Not available from CFSTI.
Columbia Univ., New York.
NORMAL IONIZING SHOCK WAVES WITH EQUILIBRIUM CHEMISTRY IN HYDROGEN.
Revised ed.
by Robert T. Taussig. 23 Nov 65, 13p
Contract AF 49 (638)-1254
Proj. AF-9752
Task 975201
AFOSR-66-1402
Revision of manuscript submitted 3 Sep 65.
Availability: Published in The Physics of Fluids v9 n3 p421-30 Mar 1966.

Descriptors: (*Hydrogen, *Shock waves), Chemical equilibrium, Gas ionization, Numerical analysis.

The steady-state jump equations for normal ionizing shock waves in hydrogen are solved numerically assuming the upstream and downstream states are at chemical equilibrium. Accurate thermodynamic functions are used to include changes due to dissociation and ionization of the gas. The results show that the solutions with chemistry are qualitatively like the ideal gas normal ionizing shock wave solutions, the number and type of possible downstream states being the same. The analysis for the switch-on shock with chemistry is presented here for the first time. Inclusion of chemical effects can extend the switch-on shock velocity range above the classical limit for an ideal gas. The problem of a steady, current-driven shock traveling in an electromagnetic shock tube is solved. The results agree well with recent experimental evidence and confirm the analytic approximations made by Kunkel and Gross. (Author)

AD-639 274 **Field 7D, 9B**
CFSTI Prices: HC$5.00 MF$1.00
Minnesota Univ., Minneapolis. Dept. of Chemistry.
A STUDY OF FUNDAMENTAL MOLECULAR PARAMETERS CONTROLLING VIBRATIONAL INTENSITIES.
Final rept., 16 Mar 62-15 Mar 65.
by Bryce L. Crawford Jr, and John Overend. 15 Mar 65, 164p
Grant DA-ARO (D)-31-124-G293
Proj. 3565-C
AROD-3565:2

Descriptors: (*Molecular spectroscopy, *Programming (Computers)), Vibration, Intensity, Fluorine compounds, Ethylenes, Infrared spectroscopy.

Identifiers: CDC 1604, CDC 160, FORTRAN.

AD-639 311 **Field 7D, 20J**
CFSTI Prices: HC$3.00 MF$0.75
C-E-I-R, Ltd., London (England).
THE SECOND PHASE OF RESEARCH ON ATOMIC STRUCTURES.
Final rept.
by D. F. Meyers, and F. O'Brien. Jun 66, 73p
Contract AF 33 (615)-2675
Proj. AF-7114
ARL-66-0109

Descriptors: (*Atomic structure, Wave functions), (*Wave functions, Hartree-Fock approximation), (*Hartree-Fock approximation, Programming (Computers)), Relativity theory, Polarization, Atomic orbitals, Electron transitions, Integrals, Mathematical programming.

A brief summary is made of the progress toward writing programs for solving the relativistic Hartree-Fock equations and the Hartree-Fock equations with configuration interaction. The possibility of predicting a polarization function for any isoelectronic sequence is discussed with particular reference to the Na I - Ar VIII sequence. Transition integrals for this sequence are presented. Results of an investigation on the form of the polarization function for the case of two electrons outside of closed shells are given. Modifications of a Hartree-Fock program written under a previous contract (see AD-617 705) are described and their Fortran listings are included. (Author)

AD-639 346 **Field 7D**
Not available from CFSTI.
Wisconsin Univ., Madison. Dept. of Chemistry.
SKELETAL REORGANIZATION IN TROPILIDENE REARRANGEMENTS.
by Jerome A. Berson, and M. Robert Willcott III. 17 Apr 65, 2p
Grant DA-ARO (D)-31-124-G497
AROD-3921:2
Availability: Published in Journal of the American Chemical Society v87 n12 p2752-3 Jun 20 1965.

Descriptors: (*Monocyclic compounds, *Molecular isomerism), Cycloalkenes, Reduction (Chemistry), Deuterated compounds, Molecular structure.

Identifiers: Rearrangement reactions, Trimethyl tropilidenes, Tropilidenes.

The mechanism of the isomerization of 3,7,7-trimethyltropilidene to 2,7,7- and 1,7,7-trimethyltropilidenes is revealed by deuterium-labeling experiments as a true skeletal reorganization of the ring carbons rather than a superficial series of methyl shifts. (Author)

AD-639 411 **Field 7D**
Not available from CFSTI.
Gates and Crellin Labs. of Chemistry, Calif. Inst. of Tech., Pasadena.
ROTATIONAL ANALYSIS OF SOME BANDS OF THE TRIPLET < SINGLET TRANSITION IN FORMALDEHYDE.
by W. T. Raynes. 17 Sep 65, 23p
Grant DA-ARO (D)-31-124-G251
AROD-3447:9
Availability: Published in The Journal of Chemical Physics v44 n7 p2755-77 1 Apr 66.

Descriptors: (*Formaldehyde, *Band spectrum), (*Molecular energy levels, Electron transitions), Molecular spectroscopy, Chemical bonds, Vibration, Molecular orbitals, Nuclear spins, Perturbation theory, Molecular properties.

A rotational analysis was performed on the two vibronic bands of the triplet-A2< singlet-A1 transition in formaldehyde in order (1) to estimate the molecular dimensions in the triplet-A2 state, (2) to obtain the molecular parameters which determine the magnitude of the spin splitting, and (3) to identify the perturbing electonic state. Also, an examination was made of the rotational line intensities in order to confirm the theory of Hougen (Can J. Phys. v42 p433 19640.

AD-639 473 **Field 7D**
Not available from CFSTI.
Queen's Univ., Belfast (Northern Ireland). Dept. of Applied Mathematics.
THE VAN DER WAALS INTERACTION OF TWO OR THREE ATOMS.
by R. J. Bell, and A. E. Kingston. 21 Mar 66, 8p
Contract N62558-4297
Availability: Published in Proceedings of the Physical Society v88 p901-7 1966.

Descriptors: (*Hydrogen, Transport properties), (*Helium group gases, Transport properties), (*Atomic energy levels, Transport properties), Atomic properties, Molecular beams, Molecular association, Spectroscopy, Refractive index, Helium, Neon, Argon, Krypton, Xenon.

Identifiers: Particle interactions, Van Der Waals forces.

The van der Waals interaction of neutral atoms may be characterized by two-body constants C (AB) and three-body constants C (ABC). A recent analysis of spectroscopic, refractive index and Verdet constant measurements was combined with a simple technique for evaluating oscillator strength summations to give C (AB) for all pairs and C (ABC) for all triplets of the atoms H, He, Ne, Ar, Kr and Xe. The results are believed to be accurate to within 10%. (Author)

NBS-TN-277 **Field 7D**
CFSTI Prices: HC$0.60 MF$0.75
National Bureau of Standards, Washington, D. C. Analytical Chemistry Div.

ANALYTICAL MASS SPECTROMETRY SECTION: INSTRUMENTATION AND PROCEDURES FOR ISOTOPIC ANALYSIS.
by William R. Shields. 25 Jul 66, 100p
Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60.

Descriptors: (*Mass spectroscopy, Chemical analysis), Instrumentation, Isotopes, Bromine, Cesium, Chlorine, Chromium, Copper, Magnesium, Plutonium, Silver, Uranium, Boron, Lithium, Rubidium, Strontium.

Contents: Analytical procedures: Parameter evaluation--sample composition and size, filament material, mounting technique, filament temperatures and heating techniques. Analyses of particular elements--Individual procedures--Bromine, Cesium, Chlorine, Chromium, Copper, Magnesium, Plutonium, Silver, Uranium. Interim procedures: Boron, Lithium, Rubidium, Strontium.

NBS-TN-291 **Field 7D**
CFSTI Prices: HC$0.30 MF$0.50
National Bureau of Standards, Washington, D. C.
A BIBLIOGRAPHY ON ION-MOLECULE REACTIONS, JANUARY 1900 TO MARCH 1966.
by F. N. Harllee, H. M. Rosenstock, and J. T. Herron.28 Jun 66, 42p
Hard copy available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.30.

Descriptors: (*Bibliographies, Chemical reactions), (*Ions, Bibliographies), (*Molecules, Bibliographies).

The present document is a bibliography on ion-molecule reactions of chemical interest. The bibliography is listed in a chronological-alphabetic arrangement and includes 431 titles and references taken from the published literature since 1900. The coverage is limited to reactions between ions and molecules leading to changes in the atomic composition of either the projectile ion or target molecule. No attempt has been made to completely cover resonant charge exchange or elastic scattering. (Author)

NBS-TN-333 **Field 7D**
CFSTI Prices: HC$0.25 MF$0.50
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
THE VISCOSITY AND THERMAL CONDUCTIVITY COEFFICIENTS OF DILUTE ARGON BETWEEN 100 AND 20001K.
by H. J. M. Hanley. 11 Mar 66, 27p
Also available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.25.

Descriptors: (*Argon, Kinetic theory), Viscosity, Thermal conductivity, High-temperature research.

The variation of the force constants of the Lennard-Jones, Exp: 6, and Kihara potential functions was investigated by comparing the Chapman-Enskog kinetic theory expression for the viscosity coefficient with the experimental viscosity of dilute argon. It was found that this variation was more pronounced than expected. It was necessary to rationalize the choice of the force constants of each function before using the function to compare theory with experimental data. Of the three, the Kihara was found to give the best correlation, and tables of the viscosity and thermal conductivity coefficients of dilute argon between 100 and 2000K were computed from this potential and the Chapman-Enskog equations. (Author)

NBS-5-NSRDS **Field 7D**
CFSTI Prices: HC$0.70 MF$0.75
National Bureau of Standards, Washington, D. C. Inst. for Basic Standards.
THE BAND SPECTRUM OF CARBON MONOXIDE.
by Paul H. Krupenie. 8 Jul 66, 94p

Descriptors: (*Carbon monoxide, Band spectrum), Gases, Molecular properties, Spectroscopy, Physical chemistry, State-of-the-art reviews.

This is an exhaustive review of the literature and a critical compilation of the observed and predicted spectroscopic data on CO, CO (+), and CO (2+) in the gas phase. (Author)

N66-24365 **Field 7D**
CFSTI Prices HC$1.00 MF$0.50
Harvard Coll. Observatory, Cambridge, Mass.
AUTOIONIZATION EFFECTS IN ULTRAVIOLET ABSORPTION SPECTRA OF HOT GASES SCIENTIFIC REPORT NO. 6.
by W. R. Garton. Nov 65, 25p NASA-CR-74807
Grant NSG-438, Contract NONR-1866/48/

Descriptors: Absorption, *Absorption spectrum, Autoionization, Electron, Gaseous, *Gaseous ionization, *Hot gas, Ionization, Line, Shape, Shock, Shock tunnel, Spectroscopy, Spectrum, Tube, Ultraviolet, *Ultraviolet spectroscopy.

For abstract, see S 04 13.

N66-24399 **Field 7D**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INTERSTELLAR MOLECULE FORMATION.
by T. P. Stecher, and D. A. Williams. Feb 66, 36p
NASA-TM-X-55462, X-613-66-72

Descriptors: Atom, Bond, Chemical, *Chemical reaction, Exchange, Formation, Forming, Gas, Grain, Interstellar, *Interstellar gas, Molecular, *Molecular forming, Molecule, Reaction.

For abstract, see S 04 13.

N66-24407 **Field 7D**
CFSTI Prices HC$3.00 MF$0.75
Centre D Etude De L Energie Nucleare, Mol (Belgium).
REGENERATION OF CERAMIC FUELS.
Regeneration Des Combustibles Ceramiques
by G. Camozzo, A. Francesconi, R. Heremans, G. Pierini, and J. Schmets. Mar 66, 66p EUR-2399.F, EURAEC-1479
Contract EURATOM-098-62-11 RDB

Descriptors: Ceramic, *Ceramic fuel, Chemical, *Chemical reaction, Dioxide, Element, Fluoride, Fluorination, Fuel, *Fuel element, Oxidation, *Plutonium, Reaction, Reactor, *Uranium.

For abstract, see S 04 13.

N66-24494 **Field 7D**
CFSTI Prices HC$7.00 MF$2.00
National Bureau Of Standards, Washington, D. C.
ELECTROCHEMICAL DATA, PART II QUARTERLY REPORT, 1 JAN. - 31 MAR. 1966.
by W. J. Hamer. 1966, 412p NASA-CR-74558
NASA ORDER R-09-022-029

Descriptors: Activity, Aqueous, Coefficient, Concentration, Data, Electrochemical, *Electrolyte, Function, Ion, Ionization, *Ionization coefficient, Mean, Printout, Solution, *Table, Volume, *Water, Weight.

For abstract, see S 04 13.

N66-24550 **Field 7D**
CFSTI Prices HC$4.00 MF$1.00
Tyco Labs., Inc., Waltham, Mass.
DEVELOPMENT OF CATHODIC ELECTROCATALYSTS FOR USE IN LOW TEMPERATURE H2/O2 FUEL CELLS WITH AN ALKALINE ELECTROLYTE SECOND QUARTERLY REPORT, OCT. 1 - DEC. 31, 1965.
by J. Giner, R. J. Jasinski, and A. C. Makrides. 1965, 124p NASA-CR-70930
Contract NASW-1233

Descriptors: Activity, Alkali, Atom, Catalyst, *Catalytic activity, Cathode, Cell, Corrosion, *Corrosion resistance, *Electrocatalyst, Electrochemical, Electrolyte, Element, Factor, Fuel, Hydrogen, Intermetallics, Interstitial, Low temperature, Material, *Material testing, Oxygen, Reduction, Refractory, Resistance, Testing.

For abstract, see S 04 13.

N66-24736 **Field 7D**
CFSTI Prices HC$3.60 MF$0.50
Sheffield Univ. (England).
KINETICS OF THE TRIPLET STATE FINAL SCIENTIFIC REPORT.
by J. W. Hilpern, and G. Porter. 30 Sep 65, 35p
AFCRL-66-12, AD-628571
Contract AF 61/052/-848

Descriptors: Absorption, *Absorption spectrum, Atom, *Atomic excitation, Chemical, *Chemical kinetics, Decay, Excitation, *Iodine, Kinetics, Luminescence, Naphthalene, Quenching, Reaction, Spectrum, State, Triplet, *Triplet state, Viscosity.

For abstract, see S 04 13.

N66-24807 **Field 7D**
CFSTI Prices HC$1.60 MF$0.50
Weizmann Inst. Of Science, Rehovoth (Israel).
NEW DETERMINATION OF THE STRENGTH OF THE NU3 BAND OF WATER VAPOR FROM DISPERSION MEASUREMENTS.
by M. A. Hirshfeld, J. H. Jaffe, and G. Ross. Nov 65, 13p AFCRL-66-38, AD-628779
Contract AF 61/052/-838
Its Sci. Note No. 4

Descriptors: Band, *Dispersion, Line, Measurement, Spectral, *Spectral band, Spectroscopy, Spectrum, Strength, Vapor, Water, *Water vapor.

For abstract, see S 04 13.

N66-24873 **Field 7D**
CFSTI Prices HC$5.00 MF$1.00
France. Office National D Etudes Et De Recherches Aerospatiales, Chatillon-sous-bagneux.
PROGRAMMED METHOD FOR DETERMINING CHEMICAL EQUILIBRIUM INCLUDING CONDENSED PHASES.
Methode Programmee De Calcul Des Equilibres Chimiques Avec Phases Condensees
by S. Barrere, B. Crampel, J. Jaubert, and M.-P. Lemaitre. 1965, 152p NT-90
In French, English Summary

Descriptors: Chemical, *Chemical equilibrium, Composition, Computation, Computer, *Computer program, *Condensation, Element, Equilibrium, Fortran, Gas, *Gas phase, Phase, Program, Reaction, Temperature.

For abstract, see S 04 13.

N66-24957 **Field 7D**
CFSTI Prices HC$3.00 MF$0.50
Florida Univ., Gainesville.
A STUDY OF GAS SOLUBILITIES AND TRANSPORT PROPERTIES IN FUEL CELL ELECTROLYTES FIRST SEMIANNUAL REPORT, 1 SEP. 1965 - 28 FEB. 1966.
by R. D. Walker Jr. 15 Mar 66, 57p NASA-CR-74779
Contract NGR-10-005-022

Descriptors: Cell, Concentration, Diaphragm, *Electrolyte, Fuel, *Fuel cell, Hydrogen, Hydroxide, Measurement, Oxygen, Polarogra-

phy, Potassium, Pressure, *Solubility, Table, *Transport property, Vapor.

For abstract, see S 04 13.

N66-25320 Field 7D
CFSTI Prices HC$2.00 MF$0.50
Western Ontario Univ., London.
IDENTIFICATION ATLAS OF MOLECULAR SPECTRA. 3 - THE NPLUS OVER 2 B 2 SIGMA-PLUS OVER U MINUS X 2 SIGMAPLUS OVER G - FIRST NEGATIVE SYSTEM OF NITROGEN.
by R. W. Nicholls, and D. C. Tyte. Apr 65, 35p NASA-CR-74950
Grant NSG-349, Contract AF 19/628/-2820

Descriptors: Bibliography, First, Gas, Identification, Ion, Ionized, *Ionized gas, Klein-dunham potential, Molecular, *Molecular spectrum, Negative, Nitrogen, *Nitrogen ion, Spectrum, System, Vibration.

For abstract, see S 04 13.

N66-25587 Field 7D
CFSTI Prices HC$1.00 MF$0.50
India. Dept. Of Atomic Energy, Bombay.
AEROSOL GENERATOR TO PRODUCE RADIOACTIVE AEROSOLS.
by S. K. Dua, G. S. Jauhri, and P. Kotrappa. 1965, 19p AEET-232

Descriptors: *Aerosol, Air, Calibration, Chloride, Compound, Dihydrogen, Electron, Filter, *Health, Heterogeneity, Material, Microscopy, Monitor, Particle, Phosphate, *Radioactive material, Radioactivity, Size, Sodium, *Sodium chloride.

For abstract, see S 04 14.

N66-25788 Field 7D
CFSTI Prices HC$2.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
ACTION SPECTRA OF THE EFFECT OF ULTRAVIOLET RADIATION ON "IN VITRO" DNA OF PHAGE ALPHA.
Spettro D'azione Per L'effetto Prodotto Dalla Radiazione Ultravioletta Sul Dna Del Fago Alpha Irradiato "in Vitro"
by M. Cremonese. 17 Nov 65, 40p ISS-65/45
In Italian, English Summary

Descriptors: Acid, Action, *Bacteriophage, Chemical, *Chemical property, Deoxy, *Deoxyribonucleic acid (dna), Dna, *Irradiation, Physical, *Physical property, Radiation, Ribonucleic, Spectrum, Ultraviolet, *Ultraviolet radiation.

For abstract, see S 04 14.

N66-25792 Field 7D
CFSTI Prices HC$1.00 MF$0.50
Argentina. Comision Nacional De Energia Atomica, Buenos Aires.
A NEW COLLOID MARKED WITH P-32. ITS PREPARATION AND DISTRIBUTION IN MICE.
Un Nuevo Coloide Marcado Con P-32. Su Preparacion Y Su Distribucion En Ratones
by H. Kurcbart, and R. Radicella. 1965, 10p CNEA-163
In Spanish, English Summary

Descriptors: Animal, *Animal study, *Colloid, Compound, Distribution, Gelatin, Hydroxide, Iron, *Iron compound, *Mouse, Phosphate, *Phosphorus, Study, Suspension, *Tracer.

For abstract, see S 04 14.

N66-26248 Field 7D
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena. Sperry Rand Research Center, Sudbury, Mass.
DEVELOPMENT OF CHEMICAL ANALYSIS TECHNIQUES FOR ADVANCED MATERIALS RESEARCH PROGRAM FINAL REPORT, 1 DEC. 1964 - 28 FEB. 1966.
by F. D. Leipziger. Mar 66, 48p NASA-CR-75095, SRRC-CR-66-4
Contracts NAS7-100, JPL-950992
Prepared For Jpl

Descriptors: Analysis, Chemistry, Discharge, Emission, Gas, *Impurity, Mass, *Mass spectrometry, Material, Method, *Oxide, Powder, Refractory, *Refractory material, Solid, Source, Spark, *Spark discharge, Spectrometry, Test, *Test method, Vacuum.

For abstract, see S 04 14.

N66-26649 Field 7D
CFSTI Prices HC$2.00 MF$0.50
Unified Science Associates, Inc., Pasadena, Calif.
GASEOUS ELECTROLYTES FOR BATTERIES AND FUEL CELLS THIRD QUARTERLY REPORT, 21 FEB. - 20 MAY 1965.
by S. Naiditch. 1965, 50p NASA-CR-75108
Contract NAS7-326

Descriptors: Ammonia, Battery, Cell, Condition, Conductivity, Density, *Electrochemistry, Electrolyte, Fuel, *Fuel cell, Gas, *Gas density, Glass, Solvent, Supercritical.

For abstract, see S 04 14.

N66-26658 Field 7D
CFSTI Prices HC$2.00 MF$0.50
Brigham Young Univ., Provo, Utah. Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
STUDIES OF REACTION GEOMETRY IN OXIDATION AND REDUCTION OF THE ALKALINE SILVER ELECTRODE.
by E. A. Butler. Apr 66, 42p NASA-CR-75126
Contracts NAS7-100, JPL-951157
Prepared For Jpl

Descriptors: Alkali, Charge, Configuration, Current, Electrochemistry, *Electrode, Geometry, *Oxidation, Oxide, Photograph, Potential, Reaction, *Reduction, *Silver, Sintering, Surface, Thickness.

For abstract, see S 04 14.

N66-26663 Field 7D
CFSTI Prices HC$1.00 MF$0.50
National Bureau Of Standards, Washington, D. C.
ELECTRON BEAM ELECTROLYSIS SECOND QUARTERLY STATUS REPORT, FEB. 15 - MAY 15, 1966.
by A. Brenner, and J. Sligh. 1 Jun 66, 10p NASA-CR-75146, NBS-9331
NASA ORDER R-09

Descriptors: Anode, Arc, Beam, Casting, *Ceramics, Connection, Cooling, *Electrolysis, Electron, *Electron beam, Evaporation, Leakage, Molten, *Salt, Solid, Technique, Tungsten.

For abstract, see S 04 14.

N66-26759 Field 7D
CFSTI Prices HC$4.00 MF$0.75
Tyco Labs., Inc., Waltham, Mass.
DEVELOPMENT OF CATHODIC ELECTROCATALYSTS FOR USE IN LOW TEMPERATURE H2/O2 FUEL CELLS WITH AN ALKALINE ELECTROLYTE THIRD QUARTERLY REPORT, JAN. 1 - MAR. 31, 1966.
by J. Giner, R. J. Jasinski, and A. C. Makrides. 1966, 102p NASA-CR-75199
Contract NASW-1233

Descriptors: Alloy, Boride, Carbide, Cell, Compound, Corrosion, *Corrosion resistance, *Electrode, Electrolyte, Fuel, Hydrogen, Hydrox, *Hydrox fuel cell, Manganese, Material, *Material testing, Metal, Oxygen, Platinum, Refractory, Resistance, Silicide, Silver, Testing, Titanium.

For abstract, see S 04 14.

N66-34187 Field 7D
CFSTI Prices HC$4.00 MF$0.75
Pennsylvania Univ., Philadelphia.
STUDIES IN FUNDAMENTAL CHEMISTRY OF FUEL CELL REACTIONS SEMIANNUAL PROGRESS REPORT NO. 8, 1 JAN. - 30 JUN. 1966.
by J. OM.Bockris. 1966, 103p NASA-CR-77031
Grant NSG-325

Descriptors: *Adsorption, Ampere, Capacity, Catalysis, Cell, Characteristics, *Chemistry, Concentration, *Electrode, Electrolyte, Film, Frequency, Fuel, *Fuel cell, Platinum, Thin, Volt, *Volt-ampere characteristics.

For abstract, see S 04 20.

N66-35052 Field 7D
CFSTI Prices HC$3.00 MF$0.75
Weizmann Inst. Of Science, Rehovoth (Israel).
MECHANOCHEMISTRY OF COUPLED CONTRACTILE AND CHEMICAL RATE PROCESSES FINAL REPORT, 1 JAN. 1964 - 31 DEC. 1965.
by A. Katchalsky. 1965, 67p AFOSR-66-1181, AD-635032
Contract AF-EOAR-64-25

Descriptors: *Biological model, Biology, Chemical, *Chemical reaction, Collagen, Contraction, Conversion, Electric, *Electrokinetics, Energy, Engine, Fiber, Force, Kinetics, Mechanical, *Mechanical property, Model, Motor, Process, Property, Rate, Reaction, Salt.

For abstract, see S 04 20.

PB-170 824 Field 7D
CFSTI Prices: HC$1.00 MF$0.50
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
REMARKS ON THE NONALYTICITY OF CORRELATION FUNCTION TRANSPORT COEFFICIENTS.
by Duane W. Condiff. 16 May 66, 13p WIS-TCI-170
Supported by NSF.

Descriptors: (*Statistical functions, *Transport properties), Statistical mechanics, Momentum, Reviews.

PB-170 829 Field 7D, 20F
CFSTI Prices: HC$2.00 MF$0.50
Forest Products Lab., Madison, Wis.
LIGHT-TRANSMITTING AND LIGHT-SCATTERING PROPERTIES OF SMOKE.
Research note.
by Gene L. Wampfler. Jun 66, 33p FPL-0137

Descriptors: (*Smokes, Light transmission), Scattering, Rayleigh scattering, Density, Measurement.

A study was made of the light-transmitting and light-scattering properties of smoke to learn more about methods of measuring smoke density. The study was done in two parts; the first consisted of a literature survey to determine what is known about light transmission and light scattering in smoke systems. In terms of light transmission measurements it was learned that the Beer-Lambert law applies to smoke, but that light-scattering theories may not apply well because of the complexity of the equations for such polydisperse systems as smoke. The second phase of the study involved experimental work which supported some of the findings described in the literature for optical measurements of smoke, specifically the application of the Beer and Lambert laws. The purpose of this work was to become familiar with the apparatus, with methods of optical measurement, and with the problems involved in smoke density meas-

urements. The results of these two phases of work allowed observations and suggestions on methods and apparatus to be used in making smoke density measurements. (Author)

AD-458 324 See Field 13H

AD-638 735 See Field 7B

AD-638 747 See Field 3B

AD-638 774 See Field 7B

AD-638 826 See Field 20H

AD-638 860 See Field 7C

AD-638 861 See Field 7C

AD-638 888 See Field 10C

AD-638 931 See Field 7B

AD-638 938 See Field 7B

AD-638 941 See Field 20L

AD-638 943 See Field 20L

AD-638 945 See Field 7B

AD-638 958 See Field 6A

AD-638 973 See Field 14B

AD-638 995 See Field 11J

AD-639 002 See Field 20C

AD-639 345 See Field 20B

AD-639 423 See Field 14B

AD-639 461 See Field 11F

AD-639 469 See Field 20L

AD-639 472 See Field 11F

AD-639 514 See Field 10A

AD-639 517 See Field 21B

AD-639 575 See Field 11I

PB-170 866 See Field 1A

PB-172 856 See Field 18J

7E. RADIO AND RADIATION CHEMISTRY

AD-638 951 Field 7E, 7C
Not available from CFSTI.
Tulane Univ., New Orleans, La. Dept. of Chemistry.
PHOTOREARRANGEMENT OF ALKYL SUBSTITUTED PHENYLCYCLOPROPANES TO OLEFINS.
by H. Kristinsson, and G. W. Griffin. 5 May 66, 8p
Grant PHS-GM-11399
AROD-4375:10
Prepared in cooperation with Louisana State Univ., New Orleans.
Availability: Published in Tetrahedron Letters n28 p3259-65 1966.

Descriptors: (*Cyclopropanes, Photolysis), (*Alkenes, Synthesis (Chemistry)), Chemical bonds, Molecular isomerism, Chemical reactions.

Identifiers: Phenyl cyclopropanes.

AD-639 000 Field 7E, 7C
Not available from CFSTI.
Gates and Crellin Labs. of Chemistry, Calif. Inst. of Tech., Pasadena.
TRIPLET STATES IN RADIATION CHEMISTRY. RADIOCHEMICAL cis-trans ISOMERIZATION.
by Richard A. Caldwell, David G. Whitten, and George S. Hammond. 3 Feb 66, 5p
Contract AF 49 (638)-1479
AFOSR-66-1807
Availability: Published in The Journal of the American Chemical Society v88 n12 p2659-63 Jun 20 1966.

Descriptors: (*Radiation chemistry, *Molecular energy levels), (*Molecular isomerism, Radiation chemistry), Alkenes, Excitation, Aromatic compounds, Ethylenes, Propenes, Organic solvents, Dienes.

Identifiers: Diphenyl butenes, Diphenyl propenes, Piperylenes, Stilbenes.

Radiation-induced cis-trans isomerization of three pairs of olefins was studied by determination of both initial rates of isomerization and the composition of radiostationary states. The data correlate strikingly well with data obtained in sensitized photoisomerization reactions of the same substrates. Consequently, it is inferred that isomerization involves formation and decay of excited triplet states of the olefins. The sum of the G values for the trans to cis and cis to trans reactions is taken as the value of G for formation of olefin triplets. Except in very concentrated solutions most of the excitation must be first absorbed by the solvent and then transferred to the solute. The highest yield of triplets measured in benzene was 9.9, and a value of 20 was estimated in an experiment in which pure cis-stilbene was irradiated. The very high G values for triplets are attributed to the fact that reactive energy acceptors can compete effectively with triplet-triplet annihilation reactions in regions of high excitation density within spurs. (Author)

AD-639 077 Field 7E, 4A
Not available from CFSTI.
McGill Univ., Nmntreal (Quebec). Upper Atmosphere Chemistry Group.
THE PHOTOLYSIS OF CO2 AT 1 470 A.
by A.-Y. Ung, and H. I. Schiff. 16 Mar 66, 11p
AROD-4381:2
Availability: Published in Canadian Journal of Chemistry v44 p1981-91 1966.

Descriptors: (*Carbon dioxide, *Photolysis), Ultraviolet radiation, Carbon monoxide, Oxygen, Upper atmosphere, Canada.

Identifiers: Quantum yield.

The apparatus used to study the photolysis contained a collimating region which minimized the effect of divergent light, and permitted the temperature of the cell and lamp to be controlled separately. Analytical sensitivity was such that conversions less than 0.2% were possible. Although CO and O2 were the only stable products, the CO/O2 ratios were higher than those required by mass balance. The product yields were found to be independent of CO2 pressure and to be linear with irradiation time at 25 C. At higher temperatures the quantum yields decreased and at 200 C were no longer linear functions of irradiation time. The O2 yields decreased when CO was added, the effect increasing with temperature. The overall quantum yield was less than unity. Reactions were observed with CH4, H2, and N2O when these were added in small amount. These results indicated the presence of a reactive species, capable of promoting back reactions and of being adsorbed on the walls. A mechanism is suggested which best fits the results and which postulates CO3 as the reactive species. (Author)

AD-639 206 Field 7E
CFSTI Prices: HC$3.00 MF$0.75
Feltman Research Labs., Picatinny Arsenal, Dover, N. J.
MOLECULAR SPECTROSCOPY WITH LOW ENERGY NEUTRONS.
Technical rept.
by Henry Boutin, Samuel Trevino, and Henry Prask. Sep 66, 61p
Proj. DA-1C014501A32B01
PA-TR-3370

Descriptors: (*Molecular spectroscopy, *Neutron scattering), (*Nuclear spectroscopy, Molecular structure), Thermal neutrons, Incoherent scattering, Elastic scattering, Inelastic scattering, Crystals, Powders, Organic nitrogen compounds, HMX, RDX.

The information contained in the neutron inelastic scattering spectra of powder or polycrystalline samples obtained by the slow chopper time-of-flight technique is a useful complement of Raman and infrared measurements. In the latter case, a number of symmetry-dependent selection rules govern the interaction and determine the various frequencies observable in the spectra. In the case of incoherent neutron scattering, such selection rules do not apply so that all energy transfers between neutrons and lattice vibrations or rotational and vibrational motions of individual molecules are observed. The technique of 'cold' neutron scattering was applied to the study of several organic molecules. The results of these studies are represented and compared with Raman and infrared measurements.

AD-639 270 Field 7E, 7C
Not available from CFSTI.
New York Univ., N. Y. Dept. of Chemistry.
ON THE PHOTOCHEMISTRY OF 6-epi-ALPHA SANTONIN, 6-epi-LUMISANTONIN AND RELATED COMPOUNDS.
by David I. Schuster, and Arthur C. Fabian. 25 May 66, 6p
Grant DA-ARO (D)-31-124-G425
AROD-4019:9
Availability: Published in Tetrahedron Letters n34 p4093-8 1966.

Descriptors: (*Polycyclic compounds, Photochemistry), (*Lactones, Photochemistry), Dienes, Ketones, Furans, Acetic acids, Spiro compounds, Photolysis, Stereochemistry.

Identifiers: Santonins, Lumisantonins.

AD-639 389 Field 7E, 11J
CFSTI Prices: HC$2.00 MF$0.50
Stanford Research Inst., Menlo Park, Calif.
A STUDY OF ENERGY TRANSFER PROCESSES IN RADIATION CHEMISTRY: TRIPLET-TRIPLET TRANSFER IN POLYBUTADIENE.
Technical rept., Mar 65-30 Jun 66.
by Morton A. Golub. Jul 66, 33p
Contract AF 33 (615)-2354
Proj. AF-7367
Task 736701
AFML-TR-66-292

Descriptors: (*Butadienes, *Radiation chemistry), (*Photochemistry, Butadienes), Molecular energy levels, Excitation, Transport properties, Molecular isomerism, Polymers, Alkenes, Additives, Benzene, Films.

Identifiers: Octenes, Polybutadienes.

Benzene photo- and radiation sensitized cis-trans isomerization of pentene-2, hexene-2, heptene-2, and octene-2 all yield the same photo- and radiostationary cis/trans ratio, viz., 1.0. Yields of benzene triplet formation and radiation-induced unsensitized isomerization of the above olefines are reported. Thin films of polybutadiene containing small amounts of certain triplet-forming organic compounds were isomerized on exposure to ultraviolet light. This demonstrates that triplet-triplet transfer from sensitizer to polymer double bonds is quite efficient in the solid state. (Author)

N66-24311 Field 7E
CFSTI Prices HC$2.00 MF$0.50
European Atomic Energy Community, Brussels (Belgium).

DETERMINATION BY NEUTRON ACTIVATION ANALYSIS OF IMPURITIES IN SOME MATERIALS STRONGLY ACTIVATED UPON IRRADIATION.
Determination Par Activation Aux Neutrons D'impuretes Dans Quelques Materiaux S'activant Fortement Au Cours De L'irradiation
by J. Pauly, R. Pietra, and E. Sabbioni. Mar 66, 36p EUR-2753.F
In French, English Summary

Descriptors: Activation, Analysis, Bromine, Chemical, *Chemical analysis, Chlorine, Compound, Germanium, Halogen, *Impurity, Isotope, Lithium, Mineral, Neutron, *Neutron activation, Phosphorus, Potassium, *Potassium compound, Radioactivity, *Radiosensitivity, *Rubidium, *Semiconductor, Sodium.

For abstract, see S 04 13.

PB-173 259 **Field 7E, 18J**
CFSTI Prices: HC$1.00 MF$0.50
Institutt for Atomenergi, Kjeller (Norway).
THE REFRACTOMETRIC DETERMINATION OF U (VI) IN AQUEOUS AND IN TBP SOLUTIONS.
by K. Joon, and P. A. Deurloo. Jun 66, 16p KR-108

Descriptors: (*Uranium, Chemical analysis), (*Solvent extraction, Uranium), Uranyl radicals, Nitrates, Concentration (Chemistry), Refractive index, Refractometers, Solutions, Organic phosphorus compounds, Hydrocarbons, Nitric acid, Reactor fuel processing, Norway.

Identifiers: Uranyl nitrate, Refractometry.

From measurements on the system UO2 (NO3)2-H2O-HNO3 in the concentration range up to 300 gU/l and up to 9 M in HNO3, a linear relationship between the refractive index (n) and the uranium concentration of the solution was obtained. The increase of the refractive index per gram of uranium is inversely proportional to the nitric acid concentration. If this system is extracted with a tri-n-butylphosphate/dodecane mixture, the refractive index of the organic solution also increases linear with the U concentration. In this case the slope of the refractive index-U concentration curve is directly proportional to the logarithm of the HNO3 concentration in the aqueous phase from which the uranium was extracted. Provided that the HNO3 concentration of a sample is known, the measurement of the refractive index can be applied for a quantitative uranium determination. If an Abbe-type refractometer is used, the error can be less than 1 gU/l for the aqueous, and less than 1.1 g U/l for the organic solutions. (Author)

AD-638 923 **See Field 8L**

AD-639 017 **See Field 20L**

AD-639 054 **See Field 20L**

AD-639 518 **See Field 21B**

N66-25487 **See Field 11I**

8A. BIOLOGICAL OCEANOGRAPHY

AD-639 491 **Field 8A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
ON THE ROLE OF DIATOMIC AND PERIDYN ALGAES IN SELF PURIFICATION OF SEA WATERS.
by N. N. Alfimov. 17 Jun 66, 14p FTD-TT-65-1906
TT-66-62353
Unedited rough draft trans. of Botanicheskii Zhurnal (USSR) v44 n6 p868-72 1959.

Descriptors: (*Sea water, Purification), (*Algae, Sea water), Bacteria, Escherichia coli, Staphylococcus aureus, Necrosis, USSR.

It was found that the Black Sea microscopic algae Prorocentrum micans, Gymnodinium najadeum and Thalassionema nitzschoides which are widespread in the plankton, considerably accelerated the destruction of Escherichia coli and Staphylococcus aureus in sea water, thus they promote auto-purification. At the same time, bethic forms of diatomic algae of the Black Sea - Actinocyclus ehrenbergi and Nitzschia closterium - do not produce an essential effect on the rate of necrosis of Escherichia coli and aurous Staphylococcus in sea water. Accumulations of substances, promoting the destruction of Escherichia coli, do not take place in the sea. These substances apparently, are continuously separated by algae in the process of their activity and are rapidly destroyed. (Author)

AD-639 519 **Field 8A**
Not available from CFSTI.
Florence Univ. (Italy). Inst. of Zoology.
RICERCHE SULL'ORIENTAMENTO ASTRONOMICO DI ANFIPODI LITORALI DELLA ZONA EQUATORIALE. II. L'ORIENTAMENTO LUNARE IN UNA POPOLAZIONE SOMALA DI TALORCHESTIA MARTENSII WEBER (Research on the Astronomical Orientation of Equatorial Littoral Amphipods. II. Lunar Orientation in One Somalian Population of Talorchestia).
by L. Pardi, and A. Ercolini. 1 Feb 65, 25p
Grant AF-EOAR-62-100
Proj. AF-9777
Task 977701
AFOSR-66-1105
Text in Italian. Summary in English. See also AD-620 528.
Availability: Published in Zeitschrift fur Vergleichende Physiologie v50 p225-49 1965.

Descriptors: (*Crustacea, *Photoperiodism), Diurnal variations, Moon, Marine biology, Seacoast, Solar radiation, Italy.

The equatorial population of Talorchestia martensii Weber of the shore of Mogadishu (Somaliland) (theoretical line of escape toward the sea, TLE= 154 degrees, about SSE) is capable of lunar orientation. However, the mechanism of lunar orientation, as well as the solar one, shows particular time variations of its correctness, due to the local astronomic circumstances. Two groups of animals were tested at the same time: one collected at sunset and one collected during the day before the night of experiments. Both sets of animals show systematic differences from the correct orientation between the period when the moon culminates South and the period when the moon culminates North. During the night of the passage of the moon at the zenith, the animals still show a correct orientation up to zenithal distances of about 8-9 degrees. For smaller zenithal distances of the moon, the animals become strongly disorientated, and for the least zenithal distances they show (likewise during the passage of the sun at the zenith) the characteristic reversible phenomenon to pile up on each other. (Author)

AD-639 537 **Field 8A**
Not available from CFSTI.
Florence Univ. (Italy). Inst. of Zoology.
RICHERCHE SULLORIENTAMENTO ASTRONOMICO DI ANFIPODI LITORALI DELLA ZONA EQUATORIALE. IV. COMPENSAZIONE DIFFERENZIALE GIORNALIERA DEL MOTO AZIMUTALE DEL SOLE IN UNA POPOLAZIONE SOMALA DI TALORCHESTIA MARTENSII WEBER. (Studies on the Astronomical Orientation of Littoral Amphipods in the Equatorial Zone. IV. Daily Differential Compensation for the Azimuthal Motion of the Sun in a Somaliland Population of Talorchestia Martensii Weber).
by Antonio Ercolini. 1964, 13p
Grant AF-EOAR-55-64
Proj. AF-9777
Task 977701
AFOSR-66-1109
Text in Italian. Summary in English. See also AD-639 519.
Availability: Published in REDIA v49 p119-28 1964.

Descriptors: (*Crustacea, *Photoperiodism), Diurnal variations, Marine biology, Seacoast, Solar radiation, Italy.

A shifting experiment has been carried out by keeping the animals under a rhythm of artificial light-darkness 3 hours in advance in respect to the normal one. The results obtained in 19 tests of solar orientation (from the 7th to the 10th day from the beginning of the treatment) show that the capacity of differential compensation of the solar azimuth velocity is essentially regulated by internal information. However, some ambiguities of behaviour observed during the tests do not permit the exclusion of the influence of external information on the orientated behaviour of the animals, at least during a transitory period in the process of phase-displacement. (Author)

PB-170 957 **Field 8A, 6C**
CFSTI Prices: HC$7.60 MF$0.75
Bureau of Commercial Fisheries, Galveston, Tex. Biological Lab.
RELEASES AND RECOVERIES OF MARKED PINK SHRIMP, PENAEUS DUORARUM BURKENROAD, IN SOUTH FLORIDA WATERS, 1958-64.
by Donald M. Allen, and T. J. Costello. Mar 66, 79p Contrib-210
Prepared in cooperation with U. S. Fish and Wildlife Service, Washington, D. C., Data Report 11.

Descriptors: (*Crustacea, Marine biology), Mexico gulf, Florida, Experimental data, Growth.

In 17 experiments in south Florida waters, pink shrimp were captured, stain-marked, released, and recaptured during the period 1958-64. This report contains data concerning place and date of release and recapture of shrimp, number, size, and sex of shrimp, and the stains used. (Author)

PB-173 210 **Field 8A, 8J, 8C**
CFSTI Prices: HC$3.00 MF$0.75
Bureau of Commercial Fisheries, St. Petersburg Beach, Fla. Biological Station.
OCEANOGRAPHIC OBSERVATIONS OF TAMPA BAY, CHARLOTTE HARBOR, PINE ISLAND SOUND, FLORIDA, AND ADJACENT WATERS OF THE GULF OF MEXICO, FEBRUARY 1964 THROUGH FEBRUARY 1965.
by Alexander Dragovich, John A. Kelly Jr, and John H. Finucane. Aug 66, 75p Contrib-28
Prepared in cocoeration with U. S. Department of Commerce, Washington, D. C. Fish and Wildlife Service, rept. no. Data rept-13.

Descriptors: (*Florida, *Oceanology), (*Mexico Gulf, Oceanographic data), (*Estuaries, Florida), Marine biology, Ecology, Collecting methods, Chemical properties, Physical properties, Analysis.

Oceanographic data are presented, and the methods of collection and analysis of samples are described. Determinations of water temperature, salinity, inorganic phosphate-phosphorus, dissolved oxygen, pH, iron, chlorophyll A, light transmission, ultraviolet absorption, cloud cover, cloud type, wind velocity, sea state, and sea direction are recorded. These data were collected as a part of continuing studies on the ecology of estuaries and the Florida red-tide organism (Gymnodinium breve). (Author)

AD-639 320 **See Field 6P**

AD-639 321 **See Field 6P**

AD-639 224 **See Field 6P**

PB-170 737 **See Field 8J**

8B. CARTOGRAPHY

AD-639 201 **See Field 8J**

AD-639 202 **See Field 8J**

AD-639 406 **See Field 4B**

8C. DYNAMIC OCEANOGRAPHY

AD-639 101 **Field 8C**
CFSTI Prices: HC$3.00 MF$0.50
National Engineering Science Co., McLean, Va.
A BIBLIOGRAPHY ON STORM SURGES AND RELATED SUBJECTS.
by C. L. Bretschneider, and G. S. Pick. 1 Aug 66, 51p SN-134-12
Contract Nonr-4177 (00)

Descriptors: (*Bibliographies, Ocean waves), (*Ocean waves, *Storms), Oceanology.

AD-639 350 **Field 8C**
Not available from CFSTI.
Woods Hole Oceanographic Institution, Mass.
THE GULF STREAM AS A GRADED RIVER.
Technical rept.
by R. M. Pratt. Jul 66, 13p WHOI-Ref-66-36
Contract Nonr-2196 (00)
Proj. NR-083-004
Availability: Published in Limnology and Oceanography v11 n1 p60-7 Jan 1, 1966.

Descriptors: (*Gulf Stream, *River currents), Hydraulic models, Rivers.

Identifiers: Blake Plateau.

The Gulf Stream flowing north through the Straits of Florida and across the Blake Plateau has many of the characteristics of a graded river. As a graded river, it transports water and sediment in such a manner that it neither erods nor aggrades its channel. The delicate balance between erosion and deposition is emphasized by the presence of scour depressions and aggradational banks side by side on the bottom, and the well-sorted Globigerina sand being winnowed over a bottom partly encrusted with manganese nodules. The hydraulic geometry of the Gulf Stream is also comparable to large rivers on land. (Author)

AD-639 273 **See Field 8J**

PB-173 210 **See Field 8A**

8D. GEOCHEMISTRY

AD-638 920 **Field 8D, 8F, 14B, 22B K**
CFSTI Prices: HC$3.00 MF$0.75
Northrop Space Labs., Hawthorne, Calif.
A SPACEFLIGHT EXPERIMENT TO ASSESS RADIATION SHIELDING CALCULATIONS.
Final rept., 1963-Oct 65.
by William H. Coop, and Mac C. Chapman. Apr 66, 88p NSL-65-158
Contract AF 33 (657)-11010
Proj. AF-6301
Task 630101
AMRL-TR-66-34

Descriptors: (*Spacecraft, Shielding), (*Shielding, Mathematical models), (*Dosimeters, Experimental design), (*Radiation hazards, *Space flight), Space environmental conditions, Programming (Computers), Protons, Electrons, Dose rate, Bremsstrahlung, Instrumentation, Experimental data, Aluminum, X rays.

The design, development, and testing of a spaceflight experiment to provide data for the assessment of mathematical shielding study models was investigated. The experiment was to provide data for assessment of mathematical shielding study models for comparison with the results obtained by a computer program. This experiment measured proton depth-dose distribution, bremsstrahlung production, and the effects of radiation anisotropy, energy spectrum, and vehicle heterogeneity under known (measured) conditions of radiation environment and vehicle geometry. The experiment instrumentation included sensors for measurement of proton and electron fluxes and spectra, and sensors to measure dosage under various shielding thicknesses of aluminum. An instrument to measure x-ray bremsstrahlung from incident electron flux was also provided. The instrument design features are discussed and methods of operation described. (Author)

N66-25025 **Field 8D**
CFSTI Prices HC$1.00 MF$0.50
General Dynamics Corp., San Diego, Calif.
ABUNDANCES OF NA, SC, CR, MN, FE, CO, AND CU IN CHONDRULES, NA, MN, AND CU IN METEORITES, AND IN IN METEORITIC AND TERRESTRIAL MATTER QUARTERLY PROGRESS REPORT, 1 DEC. 1965 - 28 FEB. 1966.
by R. A. Schmitt. 28 Feb 66, 20p NASA-CR-74881, GA-6999
Contract NASW-843

Descriptors: Activation, Analysis, *Chondrite, Chondrule, Composition, Geology, *Indium, Instrument, *Instrumental analysis, Isotope, Meteorite, *Meteoritic composition, Neutron, *Neutron activation, Radioactivity, Radiochemistry.

For abstract, see S 04 13.

N66-26687 **Field 8D**
CFSTI Prices HC$1.00 MF$0.50
Arizona State Univ., Tempe.
METEORITIC RUTILE.
by P. B. Buseck, and K. Keil. Apr 66, 22p
NASA-CR-75182
Grant NSG-399
Submitted For Publication

Descriptors: Chromite, Composition, Diffraction, Electron, Ilmenite, Lamella, Meteorite, *Meteoritic composition, Microprobe, Mineral, Oxide, Phase, *Rutile, Titanium, *Titanium oxide, X-ray.

For abstract, see S 04 14.

N66-34676 **Field 8D**
CFSTI Prices HC$2.00 MF$0.50
General Dynamics Corp., San Diego, Calif.
ABUNDANCES OF NA, SC, CR, MN, FE, CO, AND CU IN 92 METEORITES, 9 TERRESTRIAL SPECIMENS, AND 90 INDIVIDUAL CHONDRULES QUARTERLY PROGRESS REPORT, 1 SEP. - 30 NOV. 1963.
by R. A. Schmitt, and R. H. Smith. 17 Dec 63, 45p
NASA-CR-77184, GA-4782
Contract NASW-843

Descriptors: Abundance, Carbonaceous, *Carbonaceous meteorite, *Chondrite, Chondrule, Chromium, Cobalt, Copper, Distribution, Earth, Element, *Element abundance, Frequency, Iron, Manganese, Meteorite, Origin, Rare, *Rare earth, Rock, Scandium, Sodium, Terrestrial, Theory.

For abstract, see S 04 20.

AD-639 349 **See Field 21D**

8E. GEODESY

AD-638 750 **Field 8E, 9B**
CFSTI Prices: HC$5.00 MF$1.00
Raytheon Co., Alexandria, Va. Autometric Operation.
MULTIPLE STATION ANALYTICAL TRIANGULATION PROGRAM.
Final technical rept.
by Frederick J. Doyle. Dec 65, 164p
Contract DA-44-009-AMC-741 (X)
Task 4A623501D85306

Descriptors: (*Programming (Computers), *Photogrammetry), (*Geodesics, Programming (Computers)), Aerial photography, Errors, Corrections.

Identifiers: Triangulation, FORTRAN, IBM 7090, IBM 7094.

The report describes the development and testing of a comprehensive computer program for the simultaneous aerotriangulation of a large block of photographs. The program consists of five principal parts: (1) Comparator observations preprocessor; (2) Photo coordinate correction routine; (3) Aerotriangulation and pass point intersection; (4) Analysis of results; and (5) Error propagation. Part 1 is a separate program to reduce monocomparator or stereo-comparator observations to a format acceptable for computation. Parts 2, 3, 4, and 5 are combined into one efficient program which permits a wide variety of options in the handling of the data. Sufficient tests have been run to demonstrate that the formulation is valid and not restricted by operation at any latitude or longitude on the earth. (Author)

AD-638 867 **Field 8E**
CFSTI Prices: HC$1.00 MF$0.50
Photo Mapping Wing (MAC) (1370th), Turner AFB, Ga.
RESULTS OF TESTS INVOLVING TRANSFORMATION OF GEODETIC DATA BETWEEN ELLIPSOIDS.
Technical rept.
21 Mar 66, 17p TR-1

Descriptors: (*Geodesics, *Transformations (Mathematics)), Tests, Ellipsoids.

The purpose of the tests was to determine the accuracy and the adaptability to electronic and machine computing of two formulas for transformation of geodetic data between reference ellipsoids. These formulas are designed for: (a) Transformation of latitude, longitude, and geodetic height. (b) Computation of changes in geodetic distance and azimuths due to transformation of coordinates.

AD-639 110 **Field 8E**
CFSTI Prices: HC$1.00 MF$0.50
Aeronautical Chart and Information Center, St. Louis, Mo. Linguistic Section.
DETERMINING THE VERTICAL GRADIENT OF THE TERRESTRIAL ACCELERATION OF THE REAL EARTH.
Technical trans.
by I. F. Monin. Aug 66, 9p ACIC-TC-1083
TT-66-62277
Pro Vyznachennya Vertikalnogo Gradienta Zemnogo Pryskorennya Realnoi Zemli, trans. of Akademiya Nauk URSR. Dopovidi, n1 p76-9 1966.

Descriptors: (*Earth (Planet), Acceleration), (*Acceleration, Differential equations), USSR, Determination, Gravity, Surfaces.

New formulas are obtained for the calculation of anomalies of the vertical gradient delta Delta g/ delta nu of the real earth. (Author)

AD-639 111 **Field 8E**
CFSTI Prices: HC$4.00 MF$0.75
Aeronautical Chart and Information Center, St. Louis, Mo. Linguistic Section.
APPLICATION OF THE METHOD OF MODELS TO THE ANALYSIS OF FORMULAS FOR DETERMINING THE FIGURE OF THE EARTH.
Technical trans.
by V. F. Eremeev. Aug 66, 103p ACIC-TC-1062
TT-66-62278

Primenenie Sposoba Model k Issledovaniyu Formul Opredelyayushchikh Figura Zemli, trans. of Tsentralnyi Nauchno-Issledovatelskii Institut Geodezii, Aerosemki i Kartografii. Trudy (USSR), v75 p11-77 1950.

Descriptors: (*Earth (Planet), Configuration), (*Earth models, Geodesics), USSR, Surfaces, Gravity, Analysis.

Since, under practical conditions, the distribution of anomalies throughout the whole world is unknown, and gravimetric materials have many errors of gravity measurements and anomalies, four models were used for the evaluation of the errors of the formulas for determining the figure of the earth. The first model is a sphere with constant density, half immersed in a plane of infinite extension (without displacing its mass). The second model is a tore with heterogeneous density, half immersed in a sphere (without displacing its mass). The third model has also the form of a tore and sphere, but here the whole tore is situated within the sphere in order to satisfy the condition of Stokes' problem (lack of exterior masses). The first three models were used for the investigation of formulas based on Stokes' theory and the theory of studies of the geoid of a nonregularized earth. These models are inconvenient for the investigation of the formula determining the figure of the earth's physical surface, because of the discontinuity of the curvature of their exterior surface. Hence, a fourth model was used for the investigation of the latter formula. It had been obtained by the schematization of mount Alagez in Armenia (a cone with a flattened vertex set in a sphere). (Author)

AD-639 112 **Field 8E**
CFSTI Prices: HC$1.00 MF$0.50
Aeronautical Chart and Information Center, St. Louis, Mo. Linguistic Section.
SOLUTION OF STOKES' PROBLEM WITH THE PROPORTIONAL ERROR OF THE ORDER OF THE SQUARE OF THE EARTH'S FLATTENING.
Technical trans.
by B. P. Pertsev. Aug 66, 9p ACIC-TC-1102
TT-66-62279
Reshenie Zadachi Stoksa s Otnositelnoi Pogreshnostyu Poryadka Kvadrata Szhatiya Zemli, trans. of Tsentralnyi Nauchno-Issledovatelskii Institut Geoezii, Aerosemki i Kartografii. Trudy (USSR), v112 p9-12 1956. See also AD-639 113.

Descriptors: (*Geodesics, Errors), Earth, Configuration, Potential theory, USSR.

Identifiers: Stokes' formula, Molodyensky's formula.

AD-639 113 **Field 8E**
CFSTI Prices: HC$1.00 MF$0.50
Aeronautical Chart and Information Center, St. Louis, Mo. Linguistic Section.
SOLUTION OF STOKES' PROBLEM WITH THE PROPORTIONAL ERROR OF THE ORDER OF THE SQUARE OF THE EARTH'S FLATTENING.
Technical trans.
by M. S. Molodenskii. Aug 66, 11p ACIC-TC-1104
TT-66-62280
Reshenie Zadachi Stoksa s Otnositelnoi Pogreshnostyu Poryadka Kvadrata Szhatiya Zemli, trans. of Tsentralnyi Nauchno-Issledovatelskii Institut Geodezii. Aerosemki i Kartografii. Trudy (USSR), v112 p1-8 1956. See also AD-639 112.

Descriptors: (*Geodesics, Errors), Earth, Configuration, Ellipsoids, Integral equations, USSR.

Identifiers: Stokes' formula.

AD-639 186 **Field 8E**
CFSTI Prices: HC$1.00 MF$0.50
Department of the Navy, Washington, D. C.
REPORT OF THE INVESTIGATIONS IN THE FIELD OF GRAVIMETRY CONDUCTED IN THE USSR FROM 1962 TO 1965.
by Yu. D. Boulanger, and L. P. Pellinen. 26 Aug 66, 20p Trans-2191
TT-66-62293
Trans. of International Gravimetry Commission of the Internal Association of Geodesy, Paris, Sep 65, Rept., Moscow, 1965.

Descriptors: (*Gravity, Measurement), Meters, Geodesics, Reviews, Bibliographies, USSR.

Identifiers: Gravimeters.

Contents: The development of national supporting links and polygons for the standardization of gravimeters; Measurement of gravity on the sea and in the air; Determination of the shape, dimensions, and gravitational field of the earth; Secular variations in the force of gravity.

PB-172 441 **Field 8E**
CFSTI Prices: HC$1.00 MF$0.50
Smithsonian Astrophysical Observatory, Cambridge, Mass.
ON THE GRADIENT LINE OF THE EARTH'S ZONAL GRAVITATIONAL POTENTIAL.
Special rept.
by Walter Kohnlein. 1 Jul 66, 24p SAO-SR-216, 4-66-7
Grant NsG-87
Rept. on Research in Space Science.

Descriptors: (*Geodesics, Gravity), (*Gravity, Geodesics), Potential theory, Geophysics.

The shape of the gradient line of the earth's zonal gravitational potential is analyzed, and numerical results, such as the radii of curvature, the directional field, etc., are derived from the zonal harmonic coefficients of Kozai and King-Hele. (Author)

AD-638 959 **See Field 8J**

AD-638 963 **See Field 8J**

AD-639 182 **See Field 20J**

8F. GEOGRAPHY

AD-638 778 **Field 8F**
Not available from CFSTI.
Illinois Univ., Urbana.
A METHOD OF DESCRIPTIVE SHORE CLASSIFICATION AND MAPPING AS APPLIED TO THE NORTHEAST COAST OF TANGANYIKA.
by C. S. Alexander. 10 May 65, 14p
Contract Nonr-1834(35)
Proj. NR-388-063
Availability: Published in Annals of the Association of American Geographers v56 n1 p128-40 Mar 1966.

Descriptors: (*Tanganyika, *Geography), Mapping, Classification, Beaches.

The northeast shore of Tanganyika was mapped using a descriptive classification of shore zones and especially designed symbols for shore form. To test the effectiveness of the system as a means of shore description and as a basis for shore zone research, maps were made at three distinct scales. On small-scale maps (less than 1:1,000,000) the classification and symbols provide a useful means of showing the general distribution of the classes, types, and subtype of shores. The system can be used on medium-scale maps (1:125,000-1:1,000,000) in sufficient detail to reveal questions concerning processes of shore formation, and so can be a useful research tool for studying shore zone topography. Large-scale maps (over 1:125,000) appear to be most useful for detailed description of shore zones for local operational purposes. (Author)

AD-638 786 **Field 8F, 8H, 8G, 10B K**
Not available from CFSTI.
Osservatorio Geofisico Sperimentale, Trieste (Italy).
BOLLETTINO DI GEOFISICA: TEORICA ED APPLICATA (Bulletin of Geophysics: Theory and Application).
Jun 66, 84p
Text in Italian, German, and English; with attached summaries in English.
Availability: Published in Bolletino di Geofisica Teorica ed Applicata v8 n30 p83-160 Jun 1966.

Descriptors: (*Geophysics, Periodicals), Hydrology, Power supplies, Geology, Yugoslavia, Italy, Adriatic Sea, Sudan, Geophysical prospecting.

Contents: Die Beziehungen zwischen den geologischen, hydrologischen und geoelektrischen Eigenschaften des Gebirges im Jugoslawischen Karst unter besonderer Berucksichtigung der Verhaltnisse beim Bau von Kraftwerkanlagen, by Z. Krulc; Moderne indagni idrologiche nella zona di Gorizia, by S. Morgante, F. Mosetti, and E. Tongiorgi; Morfologia dell'Adriatico Settentriole, by F. Mosetti, and An unusually shaped basalt intrusion in the Sudan, by I. R. Qureshi, D. C. Almond, and A. A. Sadig.

AD-639 585 **Field 8F, 8J**
CFSTI Prices: HC$4.00 MF$0.75
Naval Oceanographic Office, Washington, D. C.
THE SEA OF OKHOTSK.
by A. K. Leonov. 1966, 113p Trans-220
TT-66-62364
Okhotskoe More, trans. of mono., Reguibaknaya Okeanografiya, Leningrad, 1960 p193-5, 197-235, 238-9, 241-76, 279-88.

Descriptors: (*Seas, USSR), Oceanology, Sea water, Physical properties, Ocean waves.

Contents: Geological history of the Sea of Okhotsk and morphometric characterization of its depression. Climate and weather. Water masses. Currents. Wave motion. Thermics. Salinity. Density. Processes of intermixing in the Sea of Okhotsk and their hydrological consequence. Transparency and color of water. Basic data on the chemistry of the Sea of Okhotsk. Vertical and geographical distribution of the main hydrochemical elements in the Sea of Okhotsk.

N66-24689 **Field 8F**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TERRAIN PHOTOGRAPHY ON THE GEMINI MISSION PRELIMINARY REPORT.
by P. D. Lowman Jr, J. A. Mc divitt, and E. H. White. Feb 66, 26p NASA-TM-X-55456, X-641-66-52

Descriptors: Astronaut, Camera, Color, *Color photography, *Earth surface, *Gemini project, *Geography, *Geology, Map, Photography, Structure, Synoptic, Terrain.

For abstract, see S 04 13.

AD-638 920 **See Field 8D**

PB-173 106 **See Field 5C**

PB-173 107 **See Field 5C**

PB-173 115 **See Field 5C**

PB-173 169 **See Field 13B**

8G. GEOLOGY AND MINERALOGY

AD-638 918 **Field 8G, 20B, 7B**
CFSTI Prices: HC$1.00 MF$0.50
Michigan Univ., Ann Arbor. Dept. of Geology and Minerology.

STUDY OF POLYTYPIC PHASE RELATIONS AMONG COMPLEX INORGANIC STRUCTURES.
Semiannual rept. no. 2, 1 Nov 65-30 Apr 66.
by Donald R. Peacor. Jul 66, 10p Rept. no. 07325-2-T
Contract DA-28-043-AMC-01338 (E)
Proj. DA-1P0-14501-B11A-00
ECOM-01338-2
See also AD-629 438.

Descriptors: (*Minerals, *Crystal structure), Crystal lattices, Phase studies, X-ray diffraction analysis, Chemical analysis, Oxides, Inorganic compounds, Twinning (Crystallography).

Identifiers: Davidite, Polytypes, Senaite.

Senaite was found to be closely related to magnetoplumbite and the hexagonal-ferrites. Three dimensional intensity data were collected, analyzed and used for the computation of the Patterson function P (u,v,w). Analysis of the implication function I3 (u,v,o) together with chemical analyses shows that it has the chemical formula Pb (Ti,Fe,Mn,Mg)24O38. Davidite, which has no cation in the closest-packed framework is shown to be isotypic with senaite and to have the formula (Ti,Fe)21O39. Thus senaite is a compositional and structural link between the Ba-ferrite type phases and other closest-packed oxide phases. Data are also presented on nigerite, plumbo-ferrite and CoGeO3. (Author)

AD-639 474 **Field 8G, 20K**
Not available from CFSTI.
Northwestern Univ., Evanston, Ill. Dept. of Materials Science.
LOW-TEMPERATURE INTERNAL FRICTION PEAK IN RUTILE.
Technical rept.
by R. D. Carnahan, and J. O. Brittain. 27 Oct 65, 3p TR-9
Contract Nonr-1228 (17)
Proj. NR-032-464
Revised ed. of manual submitted 17 Dec 64.
Availability: Published in Journal of Applied Physics v37 n4 p1808-9 Mar 15 1966.

Descriptors: (*Rutile, Internal friction), Low-temperature research.

A relaxation peak has been observed in rutile at 229K at a frequency of 9 cps. Deviations from stoichiometry and a low-temperature prestrain in the amplitude-dependent region of internal friction are necessary conditions for observing the peak. This relaxation in nonstoichiometric rutile appears to fit the category of low-temperature relaxation phenomena reported in the literature for prestrained crystalline solids. (Author)

N66-24499 **Field 8G**
CFSTI Prices HC$4.00 MF$0.75
Pennsylvania State Univ., University Park.
STUDY OF STRUCTURAL AND MINERALOGICAL SIGNIFICANCE OF METEORITE IMPACT SITES, INCLUDING MINERAL PARAGENESIS, HIGH PRESSURE POLYMORPHS, MICROFRACTURES AND QUARTZ LAMELLAE THIRD ANNUAL REPORT, JAN. - DEC. 1965.
by F. K. Aitken, D. P. Gold, B. Robertson, D. F. Tuttle, and V. Vand. Jan 66, 123p NASA-CR-74563
Grant NSG-473
Its Semiann. Rept.-5

Descriptors: Coesite, Crater, Feldspar, Fracture, Geology, Gneiss, Granite, High pressure, Lamella, Meteorite, *Meteoritic crater, *Mineralogy, Petrology, *Polymorphism, Quartz, Rock, Stishovite.

For abstract, see S 04 13.

N66-25632 **Field 8G**
CFSTI Prices HC$1.00 MF$0.50
Chalmers Univ. Of Technology, Goteborg (Sweden).
MINERALOGRAPHY IS AT LEAST AS NECESSARY AS METALLOGRAPHY.
Mineralografi Ar Lika Nodvandig Som Metallografi
by J. A. Hedvall. 1965, 21p
In Swedish, English Summary Its Trans. No. 306 Avdel. Kemi Och Kemisk Teknologi 46

Descriptors: Alloy, Application, Carbide, Chemical, Composition, Crystal, *Crystal structure, Industry, Lattice, *Metallography, Mineralogy, *Nonmetal, Oxide, Silicate, Structure.

For abstract, see S 04 14.

PB-170 993 **Field 8G**
CFSTI Prices: HC$2.60 MF$0.50
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
MINERAGRAPHY OF FAULT-ZONE SULPHIDES, BROKEN HILL, N.S.W.
Mineragraphic investigations technical paper.
by S. M. Richards. 1966, 24p TP-5

Descriptors: (*Metamorphic rock, Sulfides), (*Sulfides, Metamorphic rock), Petrology, Minerals, Faults (Geology), Australia.

The effects of deformation and metamorphism on sulphides occurring in fault-zones at Broken Hill are examined. The sulphide assemblage includes predominant sphalerite and galena with small but ubiquitous amounts of chalcopyrite, pyrrhotite, and tetrahedrite. Deformation occurred by twin and translation gliding, grain-boundary sliding, microfolding, and microfaulting. Textures were modified through subgrain formation, grain- and twin-boundary migration, and segregation from solid solutions. Several textures sugges thatt deformation and recrystallization proceeded simultaneously. Minerals are added to the system by metamorphic breakdown of tetrahedrite, by segregation from sphalerite solid solutions, by reaction between pyrrhotite and chalcopyrite, and by replacement of pyrrhotite by marcasite and pyrite. Mechanical movement of sulphides healed microfractures and tended to separate galena from sphalerite. Low temperature minerals formed during the period of post-ore deformation are now intimately associated with the main high temperature mineral assemblage, which appears to have resulted from recrystallization in an earlier phase of metamorphism. The low temperature minerals, which anomalously occur associated with the high temperature mineral assemblage, formed during low temperature post-ore deformation. (Author)

PB-170 998 **Field 8G, 13B**
CFSTI Prices: HC$3.00 MF$0.75
West Virginia Univ., Morgantown. Engineering Experiment Station.
CONDUCTING A STATEWIDE SURVEY FOR HIGHWAY AGGREGATES IN WEST VIRGINIA.
by R. W. Seeger, and J. A. Kent. 1962, 63p Bull-28
Prepared in cooperation with State Road Commission of West Virginia and Bureau of Public Roads, Washington, D. C.

Descriptors: (*Materials, Roads), (*West Virginia, *Geological survey), Rock (Geology), Construction, Limestone, Sandstone, Shale, Gravel, Maps, Geology.

Identifiers: Aggregates (Materials).

The method of conducting a highway aggregate survey and reporting its findings is presented in a typical report. This report contains information concerning the location, extent, and physical properties of natural aggregate material suitable for highway construction in one portion of West Virginia. The information is presented through Highway Construction Materials Maps, Materials Deposit Layout Sheets, and an explanatory text. (Author)

AD-638 786 **See Field 8F**
AD-638 999 **See Field 8K**
AD-639 023 **See Field 7D**
AD-639 199 **See Field 8K**
PB-170 999 **See Field 13B**
PB-173 106 **See Field 5C**

8H. HYDROLOGY AND LIMNOLOGY

AD-638 762 **Field 8H**
Not available from CFSTI.
Carnegie Institution of Washington, D. C. Dept. of Terrestrial Magnetism.
A STUDY OF HEAT FLOW AND THERMAL PROPERTIES IN SENECA LAKE, NEW YORK.
by S. R. Hart, and J. S. Steinhart. 1 Mar 65, 6p
Grant Nonr (G)-00081-64
Report on project Heat Flow Measurements in 1964.
Availability: Published in unidentified journal.

Descriptors: (*Lakes, Thermal properties), Heat transfer, Hydrology, New York.

Identifiers: Seneca Lake.

Two sets of measurements of thermal gradient were made in Seneca Lake, New York in July and October 1964. In the October measurements cores and thermal measurements were obtained to depths of 20 feet. So far there appears to be no large perturbations in the thermal gradient and the calculated heat flow values are quite reasonable, although this does not prove that they are correct. Continuous bottom temperature recorders placed in operation in Seneca Lake in August operated satisfactorily until October. Recorders are still in place in Seneca Lake. Procured armored instrument cable to enable probe to be handled on a single wire. Initial shipments failed to meet specifications, hence the cable was not employed in the October measurements. The correct cable is now on hand and will be used in the next set of measurements. Results to July 1964 are summarized in the enclosed excerpt from the Carnegie Annual Report. (Author)

AD-638 786 **See Field 8F**
PB-170 966 **See Field 13B**

8J. PHYSICAL OCEANOGRAPHY

AD-638 775 **Field 8J**
Not available from CFSTI.
Scripps Institution of Oceanography, La Jolla, Calif.
SUMMARY OF COMPUTER-ANALYZED TEMPERATURE DATA FOR PACIFIC AND ATLANTIC OCEANS.
by Margaret K. Robinson. 22 Aug 66, 21p
Contract Nonr-2216 (23)
Proj. NR-083-005
Availability: Published in Proceedings of the symposium, United States Navy Electronics Lab., San Diego, Calif. p253-72.

Descriptors: (*Atlantic Ocean, Bathythermograph data), (*Pacific Ocean, Bathythermograph data), (*Oceanology, Bathythermograph data), Hydrographic surveying, Oceanographic data, Graphics.

AD-638 959 **Field 8J, 8E**
Not available from CFSTI.
Osservatorio Geofisico Sperimentale, Trieste (Italy).
GEOPHYSICAL SURVEYS IN THE MEDITERRANEAN AND RED SEAS DURING THE PERIOD 1961-64.

by T. D. Allan, and C. Morelli. 1965, 4p Contrib-158
Availability: Published in C.I.E.S.M.M., Rapports et Proces-verbaux des Reunions, v. 18 n3 p912-6.

Descriptors: (*Marine geophysics, Reviews), (*Mediterranean Sea, Marine geophysics), (*Red Sea, Marine geophysics), Terrestrial magnetism, Gravity, Oceanographic vessels, Oceanographic equipment, Italy.

A summary is given of geophysical survey cruises undertaken in the Red and Mediterranean Seas during 1961 to 1964 by the Osservatorio Geofisico Sperimentale under contract to the Saclant ASW Research Centre. Most of the work involved gravity and magnetic field measurements.

AD-638 963 **Field 8J, 8E**
Not available from CFSTI.
Osservatorio Geofisico Sperimentale, Trieste (Italy).
GRAVITY, MAGNETIC AND DEPTH MEASUREMENTS IN THE LIGURIAN SEA.
by T. D. Allan, and M. Pisani. 1963, 3p Contrib-159
See also AD-638 959.
Availability: Published in C.I.E.S.M.M., Rapports et Proces-verbaux des Reunions, v18 n3 p907-9.

Descriptors: (*Mediterranean Sea, *Marine geophysics), Gravity, Terrestrial magnetism, Depth finding, Ocean bottom topography, Oceanographic vessels, Italy.

Identifiers: Ligurian Sea.

AD-639 198 **Field 8J**
CFSTI Prices: HC$6.00 MF$1.25
Massachusetts Inst. of Tech., Cambridge. Dept. of Geology and Geophysics.
AN ON-THE-BOTTOM SEA GRAVIMETER.
Doctoral thesis.
by Charles Goddard Wing. Jun 66, 219p
Contract Nonr-1841 (74)
Proj. NR-083-157

Descriptors: (*Meters, Oceanographic equipment), (*Gravity, Meters), Accelerometers, Vibration.

Identifiers: Gravimeters.

90% of the ocean floor lies beyond the reach of present marine gravimeters. For features with dimensions of the same order as the water depth, resolution demands an on-the-bottom profile. An inertial guidance component, the American Bosch Arma Lot D vibrating string accelerometer was adapted to measure gravity automatically in a free-fall, on-the-bottom vehicle. By special techniques, an accuracy in the range 1-2 mgal was obtained under preliminary operating conditions. (Author)

AD-639 201 **Field 8J, 8B**
CFSTI Prices: HC$3.00 MF$0.75
Woods Hole Oceanographic Institution, Mass.
TRACK CHARTS, BATHYMETRY, AND LOCATION OF OBSERVATIONS, ATLANTIS II CRUISE NO 13, NORTH ATLANTIC OCEAN, SEPTEMBER 1, 1964-OCTOBER 5, 1964.
Summary rept.
by B. A. Cormack, and W. M. Dunkle. Apr 66, 94p WHOI-Ref-66-15
Contracts Nonr-4029 (00), Nonr-2196 (00)
Projs. NR-260-101, NR-083-004
Research supported in part by Grants NSF-GB-543 and NSF-GB-861.

Descriptors: (*Hydrographic surveying, *Atlantic Ocean), (*Oceanology, Atlantic Ocean), Oceanographic data, Maps, Ocean bottom topography.

Identifiers: Atlantis cruise.

There are 39 charts plotted on a Mercator Projection (scale 1 degree longitude equals 4 inches) showing the track of the entire cruise. All types of observations made during the cruise are noted by suitable symbols or legends along the ship's track. Chart I shows overall cruise track with sightings of whales and porpoise indicated. Chart II shows locations of all other observations made. Soundings are read at equal time intervals, usually every ten minutes and at each break in slope. They are written along the ship's track as often as space permits. (Author)

AD-639 202 **Field 8J, 8B**
CFSTI Prices: HC$2.00 MF$0.50
Woods Hole Oceanographic Institution, Mass.
TRACK CHARTS, BATHYMETRY, AND LOCATION OF OBSERVATIONS, CHAIN CRUISE NO 53, NORTH ATLANTIC OCEAN, HATTERAS ABYSSAL PLAIN, 14 OCTOBER-27 OCTOBER 1965.
Summary rept.
by J. M. Douglass, and W. M. Dunkle. Jun 66, 48p WHOI-Ref-66-38
Contract Nonr-4029 (00)
Proj. NR-260-101

Descriptors: (*Hydrographic surveying, *Atlantic Ocean), (*Oceanology, Atlantic Ocean), Oceanographic data, Maps, Ocean bottom topography.

Identifiers: Chain cruise, Hatteras Abyssal Plain.

There are 16 charts plotted on a Mercator Projection (Scale 1 degree longitude equals 4 inches) showing the track of the entire cruise. All types of observations made during the cruise are noted by suitable symbols or legends. Soundings are read at either equal time intervals or at each break in the slope. They are written along the ship's track as often as space permits. (Author)

AD-639 273 **Field 8J, 8C, 14B, 5A K**
CFSTI Prices: HC$4.00 MF$0.75
Bio-Dynamics, Inc., Cambridge, Mass.
SUGGESTED OCEANOGRAPHIC UTILIZATION OF THE MAN-IN-THE-SEA CONCEPT.
Interim rept.
by D. B. Haswell, H. S. Chamberlin, and R. W. Brigham. 30 Sep 65, 104p
Contract NOsp-65167-c

Descriptors: (*Laboratories, Underwater), Manned, Oceanology, Underwater equipment, Oceanographic equipment, Site selection, Deep submergence, Scientific personnel, Training, Standards, Research program administration.

Identifiers: Man-in-the-Sea program.

The document describes the potential utilization of manned underwater laboratories by oceanographic and related investigators during the 1965-1970 time period. Suggested research programs, instrumentation requirements to support these programs, and site preference for geographical location of underwater laboratories are discussed. The study supports the feasibility and desirability of active participation in the Navy's Man-in-the-Sea Program by the oceanographic research scientist. It points up requirements generated by this participation which will require further definition and development, and includes some technical derivatives on laboratory design considerations, manned submersibles, and external instrumentation requirements. The desirability for a Navy-sponsored Symposium on Underwater Oceanography in the near future to establish liaison with the oceanographer and define his relationship to underwater project development is emphasized and recommended. (Author)

AD-639 589 **Field 8J, 20A**
CFSTI Prices: HC$3.00 MF$0.50
Woods Hole Oceanographic Institution, Mass.
OCEANOGRAPHIC AND UNDERWATER ACOUSTICS RESEARCH.
Progress rept. for 1 Nov 65-30 Apr 66.
Jul 66, 56p WHOI-Ref-66-43
Contract Nonr-4029 (00)
Proj. NR-260-101
See also AD-618 485.

Descriptors: (*Underwater sound, Scientific research), (*Oceanology, Scientific research), Underwater sound equipment, Marine geophysics, Ocean bottom sampling.

The objective of the contract is to provide by research the broad environmental background needed for the design, developmental test, and operational guide-lines of underwater devices of the Navy. The contract work consists of a broad research program in oceanic acoustics, physical oceanography, and sea floor properties. Two geological and geophysical cruises of the R/V CHAIN were mounted in the Caribbean Sea and in the western North Atlantic Ocean. Precision echo soundings, measurements of gravity and magnetic field intensity, continuous seismic profiles using the spark source, bottom samples by coring and dredging, and bottom photographs were taken. Analyses of geophysical and geological data from the North Atlantic Ocean, the Indian Ocean, and the Caribbean Sea have been completed or are underway. Theoretical and experimental work on hydrophone arrays for receiving underwater and seismic reflection signals has been continued. A towed quartz thermometer and inverted echo-sounder system for recording temperature-depth profiles has been developed. Development continues on a towed thermistor-string system for recording a temperature profile of the upper 500 m of seawater. (Author)

N66-24393 **Field 8J**
CFSTI Prices HC$3.00 MF$0.50
Aracon Geophysics Co., Concord, Mass.
THE FEASIBILITY OF SEA SURFACE TEMPERATURE DETERMINATION USING SATELLITE INFRARED DATA.
by C. J. Bowley, J. R. Greaves, and R. Wexler.
May 66, 54p NASA-CR-474
Contract NASW-1157

Descriptors: Cloud, Contamination, Cover, Data, Feasibility, Gradient, Infrared, *Infrared instrument, Instrument, Measurement, Meteorology, Satellite, *Satellite measurement, Sea, *Sea water, Surface, *Surface temperature, Temperature, Water.

For abstract, see S 04 13.

PB-170 737 **Field 8J, 8A, 13J**
CFSTI Prices: HC$3.00 MF$0.75
European Market Consultants, Wiesbaden (West Germany).
OCEANOGRAPHY IN GERMANY MARINE SCIENCE AND UNDERWATER TECHNOLOGY.
by J. W. Marshall. Apr 66, 65p
Contract F-TC-117/66
Rept. on The Market for Oceanographic Equipment in West Germany. Prepared for Dept. of Commerce/Business and Defense Services Admin.

Descriptors: (*Oceanographic equipment, West Germany), Commerce, Marine engineering, Marine biology, Underwater television systems, Underwater photography, Oceanology.

AD-638 848 **See Field 18H**

AD-639 061 **See Field 8M**

AD-639 218 **See Field 7D**

AD-639 219 **See Field 7D**

AD-639 220 **See Field 7D**

AD-639 352 See Field 9B

AD-639 462 See Field 8L

AD-639 585 See Field 8F

PB-173 210 See Field 8A

8K. SEISMOLOGY

AD-638 708 Field 8K
Not available from CFSTI.
California Univ., Berkeley.
LETTERS TO THE EDITOR: MAGNITUDE STABILITY IN EARTHQUAKE SEQUENCES.
by C. Lomnitz. Feb 66, 5p
Contract AF 49 (638)-1506
Proj. AF-5810
AFOSR-66-1265
Availability: Published in Bulletin of the Seismological Society of America v56 n1 p247-9 Feb 1966.

Descriptors: (*Earthquakes, California), Seismology, Intensity, Stability, Sequential analysis.

The magnitudes of aftershocks appear to fluctuate about a stable mean value in time. The aftershocks from three California sequences (Kern County, 1952; San Francisco, 1957; and Watsonville, 1963) were plotted and found to have a stable mean magnitude throughout their duration. A test of magnitude stability was conducted using 224 aftershocks of magnitude greater than or equal to 4.0, from the Kern County, 1952 sequence. The computed deviation from constancy of the mean magnitude as a function of time was less than 1%. (Author)

AD-638 844 Field 8K, 20K
Not available from CFSTI.
California Inst. of Tech., Pasadena. Seismological Lab.
THE FIELD FROM AN SH-POINT SOURCE IN A CONTINUOUSLY LAYERED INHOMOGENEOUS MEDIUM: I. THE FIELD IN A LAYER OF FINITE DEPTH.
by N. J. Vlaar. 18 Nov 65, 10p
Contract AF 49 (638)-1337
Div. of Geological Sciences. See also Contrib-1383, California Inst. of Tech.
Availability: Published in Bulletin of the Seismological Society of America v56 n3 p715-24 Jun 1966.

Descriptors: (*Seismic waves, Propagation), (*Acoustics, Earth (Planet)), Seismology, Stratigraphy.

Expressions are derived for the field from an SH point source in a stratified heterogeneous layer of finite depth. It is found, that for a periodic disturbance, the contribution to the far field is mainly due to at most a finite number of unattenuated normal Love modes. The transient response of the medium is obtained by a Fourier synthesis. The final expressions are of a simple form, involving the eigenfunctions of a Sturm-Liouville boundary value problem. The excitation of a certain mode as a function of frequency and source depth is formulated in a concise form. (Author)

AD-638 849 Field 8K
Not available from CFSTI.
California Inst. of Tech., Pasadena. Seismological Lab.
P AND S WAVE TRAVEL TIMES AND SPHEROIDAL NORMAL MODES OF A HOMOGENEOUS SPHERE.
by James N. Brune. 17 Jan 66, 7p
Contract AF 49 (638)-1337
See also Contrib-1389, California Inst. of Tech., Pasadena. Geological Sciences Div.
Availability: Published in Journal of Geophysical Research v71 n12 p2959-65 Jun 15 1966.

Descriptors: (*Seismic waves, Spheres), Mechanical waves, Propagation, Oscillation, Mathematical analysis.

The physical relation between P and S wave travel-time curves and torsional and spheroidal dispersion curves for a homogeneous sphere has been demonstrated. The dispersion curves represent interference conditions for multiply reflected body waves: SH waves in the case of torsional oscillations and P and SV waves in the case of spheroidal oscillations. The interference equations have been derived both by considering constructive interference requirements for rays and by substituting asymptotic expressions for Bessel functions in the period equations. (Author)

AD-638 854 Field 8K
Not available from CFSTI.
California Inst. of Tech., Pasadena. Seismological Lab.
SURFACE WAVE ENERGY FROM POINT SOURCES IN PLANE LAYERED EARTH MODELS.
by David G. Harkrider, and Don L. Anderson. 17 Jan 66, 14p
Contract AF 49 (638)-1337
See also Contrib-1386, California Inst. of Tech, Pasadena. Geological Sciences Div.
Availability: Published in Journal of Geophysical Research v71 n12 p2967-80 Jun 15 1966.

Descriptors: (*Seismology, Earth models), (*Seismic waves, Propagation), Energy, Distribution, Mathematical analysis.

The total energy contained in a surface wave can be computed from its propagation-corrected spectrum by integrating over the surface of the earth and over the depth of the wave guide. The former requires knowledge of the radiation pattern of the source. The latter requires only a knowledge of the variation of physical properties with depth. In this paper the depth integration is performed for a continental and an oceanic earth model for three Rayleigh modes and four Love modes. The results are presented in tables and graphs in such a way that it is convenient to convert an observed surface wave displacement or displacement spectrum to total energy density. If the surface radiation pattern is known, the surface integration then yields the total energy in the observed spectrum. The partitioning of energy between surface wave modes is computed for several simple sources at the surface and at depth, making it possible to estimate the energy contained in frequency bands or modes which are inaccessible for direct analysis. The increasing importance of the higher modes in the total energy budget at short periods and for channel depth sources is demonstrated. The shapes of the spectrums are diagnostic of source orientation and depth. (Author)

AD-638 855 Field 8K
Not available from CFSTI.
California Inst. of Tech., Pasadena. Seismological Lab.
PP AND CRUSTAL STRUCTURE.
by Francis T. Wu, and W. J. Hannon. 28 Sep 65, 15p
Contract AF 49 (638)-1337
See also Contrib-1382 California Inst. of Tech. Pasadena. Div. of Geological Sciences.
Availability: Published in Bulletin of the Seismological Society of America v56 n3 p733-47 Jun 1966.

Descriptors: (*Seismic waves, Propagation), (*Acoustics, Lithosphere), Seismology.

Haskell's formulation for reflection of P waves at the base of a solid crust is extended to include overlying liquid layers. Normalized displacement and the phase shift at the base of the crust as a function of angle of incidence and frequency are calculated for two continental models and an oceanic model. Complex reflection coefficients are inverse Fourier transformed to the time domain to show the change of pulse shape upon reflection These time traces show that the water layer of the oceanic model causes the main difference between continental and oceanic reflections. Sample seismograms from a deep shock were compared to the theoretical records; they were found to be consistent. It is concluded that the amplitude ratio PP/P as a function of frequency obtained from seismograms can be used to decipher the detailed structure at the point of reflection only after the radiation pattern of the source, attenuation of waves during propagation, and crustal transmission response at the receiver are properly taken into account. (Author)

AD-638 856 Field 8K
Not available from CFSTI.
Lamont Geophysical Observatory, Palisades, N. Y.
SEISMIC PARAMETER PHI: COMPUTATION AT VERY HIGH PRESSURE FROM LABORATORY DATA.
by Orson L. Anderson. 17 Nov 65, 8p Contrib-915
AF 49 (638)-1355
Prepared in cooperation with Bell Telephone Labs., Inc., Murray Hill, N. J.
Availability: Published in Bulletin of the Seismological Society of America v56 n3 p725-31 Jun 1966.

Descriptors: (*Seismology, High-pressure research), Ultrasonic radiation, Seismic waves, Equations of state, Experimental data.

By using the accuracy inherent in ultrasonic velocity measurements taken at pressures less than 10 kb, the seismic parameter phi = sq v sub p - (4/3) sq v sub s can be computed at very high pressures. The equation used requires the assumption that the second derivative with respect to pressure of the bulk modulus be negligible at all pressures considered. This assumption is checked by computing the compression (V/V sub 0) in the pressure range by equations of state using the assumption, and comparing the resulting values with measured compression. Illustrations are given for MgO and Al2O3. (Author)

AD-638 912 Field 8K
CFSTI Prices: HC$2.00 MF$0.50
Geotech Div., Teledyne Industries, Inc., Garland, Tex.
STUDY OF SHORT-PERIOD SEISMIC NOISE.
Semiannual technical rept. no. 8, 1 Jan-30 Jun 66.
by E. J. Douze. 8 Aug 66, 32p TR-66-80
Contracts AF 49 (638)-1150, ARPA Order-292-62
ARPA Order-292-63. See also AD-628 883.

Descriptors: (*Microseisms, Sources), (*Seismology, Microseisms), Background Noise, Statistical analysis.

The report describes studies on spectral moments, sources of microseisms, statistical analysis, short-period surface waves, and the Special Orientation Program. (Author)

AD-638 960 Field 8K
Not available from CFSTI.
Lamont Geological Observatory, Palisades, N. Y.
THE SEISMICITY AND DEEP STRUCTURE OF ISLAND ARCS.
Revised ed.
by Lynn R. Sykes. 16 Mar 66, 29p LGO-909, Scientific-9
Contract AF 19 (628)-4082, ARPA Order-292
Proj. AF-8652
Task 865201
AFCRL-66-596
Revision of manuscript submitted 17 Dec 1965.
Availability: Published in Journal of Geophysical Research v71 n12 p2981-3006 Jun 15 1966.

Descriptors: (*Seismology, Pacific Ocean islands), Earthquakes, Volcanoes, Epicenter, Structural geology, Nuclear explosions, Iterative methods, Least squares method, West Indies.

The hypocenters of approximately 1500 earthquakes in the Tonga-Fiji, Kermadec, Kuril-Kamchatka, and Caribbean regions were redetermined using a digital computer. In each of the regions investigated in this paper a zone of intense seismic activity was found beneath the inner (islandward) margin of the oceanic trench. Near its northern end the Tonga trench curves abruptly to the west; the belts of shallow and deep earthquakes and the chain of active volcanoes curve similarly. Earthquake foci in the Tonga-Fiji region are confined to a zone about 50 to 100 km thick that dips under the arc and that extends from the surface to a depth of about 650 km. It is unlikely that this pronounced peak in the deep-focus activity is associated either with a phase change or with a particular layer unless the physical or chemical properties of the mantel have large lateral variations. (Author)

AD-638 999 **Field 8K, 8G**
Not available from CFSTI.
California Univ., Berkeley. Seismographic Station.
AZIMUTH AND SLOWNESS ANOMALIES OF SEISMIC WAVES MEASURED ON THE CENTRAL CALIFORNIA SEISMOGRAPHIC ARRAY. PART I. OBSERVATIONS.
by Michio Otsuka. 3 Sep 65, 19p
Contract AF 49 (638)-1506, Grant NSF-GP-1922
Proj. AF-5810
AFOSR-66-1264
Availability: Published in Bulletin of the Seismological Society of America v56 n1 p223-39 Feb 1966.

Descriptors: (*Seismic waves, Structural geology), Seismographs, Azimuth, California.

The differences in arrival-times between array elements of coherent peaks or troughs of P and pP phases from 28 teleseisms in the period of 1963-1964 were read from the telemetry records of the central California seismographic array. The direction of approach and velocities of the wave fronts were then determined and compared with the great circle azimuths and with the apparent velocities calculated from the Jeffreys-Bullen tables. The observed anomalies in direction of approach and apparent velocities are found to be cyclic functions of the direction of the source. The amplitudes of these functions are almost 10 degrees in azimuth anomaly and 1.0 sec/deg in slowness anomaly. Error analyses show that the anomaly functions cannot be attributed to the measurement errors. The derived anomaly functions provide a powerful means of examining crustal and upper mantle structure under the array and perhaps at the source. Variations between subsets of the array indicate significant differences in structure between portions of the Coast Ranges to the north and to the south of Hollister. (Author)

AD-639 197 **Field 8K, 17J**
CFSTI Prices: HC$2.00 MF$0.50
Lincoln Lab., Mass. Inst. of Tech., Lexington.
LARGE APERTURE SEISMIC ARRAY CAPABILITIES.
Technical rept.
by Paul E. Green Jr, and Ralph V. Wood Jr. 12 Jul 66, 28p TR-421
Contract AF 19 (628)-5167
ESD-TR-66-361

Descriptors: (*Seismometers, Reliability), Seismology, Performance (Engineering), Montana, Seismological stations, Detection, Nuclear explosions, Underground explosions, Effectiveness.

Identifiers: LASA.

The report presents the results of a study of the effectiveness of the experimental Large Aperture Seismic Array in Montana. An attempt has been made, where possible, to draw conclusions from the study of this one station about the performance that might be expected from a worldwide net of several of them. The report discusses the reliability and continuity of observations obtainable from a LASA system, the threshold level for automatic detection and location of weak events, the various signal-to-noise enhancement processes available for on-line and off-line use, and the effect of such enhancements on the ability to discriminate source type. The engineering approaches and system organization that were chosen appear to have resulted in a system of high reliability in the presence of normal componentfailures, noise, and seismic interference. The 50 percent detection threshold being currently achieved by relatively crude on-site processing is estimated at magnitude 3.5. Off-line processing gains in signal-to-noise ratio equivalent to a magnitude differential of 1-1/4 over a single seismometer output are available. The improvement in ability to see waveform features for identification depends on the type of feature being examined. For first motion, it varies with the signal-to-noise gain; for pP, it is significantly larger. (Author)

AD-639 199 **Field 8K, 8G**
CFSTI Prices: HC$3.00 MF$0.50
Massachusetts Inst. of Tech., Cambridge. Dept. of Geology and Geophysics.
IMPROVED HIGH-RESOLUTION SEISMIC PROFILING.
Master's thesis.
by Donald J. Krotser. Jun 66, 52p
Contract Nonr-1841 (74)
Proj. NR-083-157

Descriptors: (*Seismology, *Marine geology), Hydrophones, Recording systems, Design, Seismographs.

High repetition-rate seismic reflection profiling is a technique used at sea to obtain visual analogues of geologic cross-sections. The thesis reports the development of a high resolution profiling system which was field-tested in Boston Harbor. The system incorporates several improvements over conventional apparatus. Visual display of the profiles is produced from playback of magnetic tape-recordings. A tape-recording is used to trigger the sweep and to modulate the beam of a cathode-ray tube; successive traces are recorded across slowly-moving 35 mm. film. Electronic sweep control and optical stacking onto photographic emulsion allow greater flexibility and dynamic range than the mechanical sweep stacking on electro-sensitive paper employed by pre-existing facsimile recorders. Edgerton's boomer sound source was modified to eliminate cavitation and to give non-oscillatory acoustic pulses of 118 decibels peak pressure (relative to 1 dyne/sq cm at 1 meter). The initial impulse (0.1 millisecond long) is followed by a slow decay which provides low-frequency energy for deeper penetration. (Author)

AD-639 386 **Field 8K**
CFSTI Prices: HC$4.00 MF$1.00
Saint Louis Univ., Mo. Inst. of Tech.
THE S WAVE PROJECT FOR FOCAL MECHANISM STUDIES. THE ALASKA EARTHQUAKE SEQUENCE OF 1964.
by William Stauder, and G. A. Bollinger. 31 Jul 66, 132p Scientific-1
Contract AF 19 (628)-5100, ARPA Order-292
Proj. AF-8652
Task 865201
AFCRL-66-572

Descriptors: (*Earthquakes, Alaska), Seismic waves, Seismology.

The polarity of the P wave first motion in the main shock yields a single well determined nodal plane with strike N66 degrees E, dip 85 degrees to the southeast. The focal mechanism of the earthquakes related to the main shock bear a remarkable similarity to one another and to the main shock. In all but three cases there is a single steeply dipping nodal plane of P. For earthquakes in the Kodiak Island region this plane has the same orientation as that of the main shock. For earthquakes to the east of Prince William Sound the near vertical nodal plane P shows a systematic change in orientation corresponding to the change in trend of the tectonic features. For all of these shocks excellent S wave data permit the determination of the second nodal plane, indeterminant from the P wave data. It is found to have a dip of about 10 degrees to the northwest or north. By inference, the second nodal plane of the main shock has the same orientation. (Author)

AD-639 435 **Field 8K, 17B, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Michigan Univ., Ann Arbor. Inst. of Science and Technology.
COLLECTION AND ANALYSIS OF SEISMIC WAVE PROPAGATION DATA. SUPPLEMENT 2: AN ERROR ANALYSIS OF DIGITAL EQUALIZING FILTERS.
by John F. Hemdal. Aug 66, 25p Rept. no. 5178-64-F2
Contract AF 49 (638)-1170, ARPA Order-292-62
Proj. AF-8100
Supported in part by ARPA Order-292-65.

Descriptors: (*Seismic waves, Propagation), Seismographs, Signal-to-noise ratio, Errors, Processing, Collecting methods.

Present day computer systems allow computation of an approximate Wiener operator for the time-domain filtering and smoothing of signals of finite and short length. However, the memory capacity of a particular computer storage introduces a constraint on the length of the operator and signal. To produce the least mean-square-error, it was helpful to know the extent to which the length of the operator should be compromised by including additional information (sample points) of the signal. If N is the number of samples of the signal to be equalized and T is the number of points in the optimum digital operator then the system imposes the constraint that $KN + T(2) < M$ where M is the free capacity of the computer memory and K is the number of multiples of signal length required for the correlations. To find out whether an optimum relation between T and N exists, a program to determine the digital operator and to compute the mean-square-error between the filtered result and the desired signal was written for an IBM 7090 computer. The computed errors for some typical seismic signals are presented as a function of operator length, signal length, signal-to-noise ratio, and the number of records used to determine averages. The results suggest that equalization occurs both as a process of signal shaping and of noise reduction, but not necessarily simultaneously. The optimal parameters for optimum equalization depend on the nature of the signal and noise, and may require new determination under novel conditions. (Author)

8L. SNOW, ICE, AND PERMAFROST

AD-638 717 **Field 8L**
CFSTI Prices: HC$1.00 MF$0.50
Cold Regions Research and Engineering Lab., Hanover, N. H.
TIME DEPENDENT DEFLECTION OF A FLOATING ICE SHEET.
Research rept.
by Donald E. Nevel. Jul 66, 16p RR-196
Task 1V025001A13001

Descriptors: (*Ice, Deflection), Sheets, Viscoelasticity, Mathematical analysis, Stresses, Deformation, Loading (Mechanics), Ice islands.

A solution for a viscoelastic plate on an elastic foundation is presented for an infinite bulk modulus and a shear modulus which obeys Maxwell's model. Observed deflections of a floating ice sheet agree with this solution. A solution for a viscous shear modulus is also presented. (Author)

AD-638 923 **Field 8L, 7E**
CFSTI Prices: HC$2.00 MF$0.50
Cold Regions Research and Engineering Lab., Hanover, N. H.
CONDUCTIVITY CHANGES PRODUCED IN ICE BY OPTICAL IRRADIATION .8 TO 2.7.
Research rept.
by P. R. Camp, and D. L. Spears. Aug 66, 33p RR-175
Task 1V014501B52A02

Descriptors: (*Photochemistry, Ice), (*Ice, Electrical conductance), Light, Absorption, Crystal lattice defects.

A series of experiments attempt to produce orientational defects and ions by optical injection. The basic experiment was one on transient photo-conduction produced by an intense light pulse. The effects of intensity and wavelength of the incident light, temperature of the sample and area of illumination of the sample were studied. It was concluded that neither orientational defects nor ion pairs were produced in appreciable quantity by the light but that the apparent photo-conduction observed was the result of flash-heating of a thin surface region which had significantly different properties than had the bulk of the sample. Simple and somewhat speculative assumptions regarding the photogeneration process lead to the conclusion that the photo-efficiency, at least for ion pair production, must be very low. (Author)

AD-639 462 **Field 8L, 8J, 4B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technogy Div., Wright-Patterson AFB, Ohio.
ALBEDO OF THE SNOW-ICE COVER OF THE SEA.
by A. P. Koptev. 15 Jun 66, 22p FTD-HT-66-182
TT-66-62344
Unedited rough draft trans. of Arktiki i Anarktiki (USSR) n15 p25-36 1964.

Descriptors: (*Snow, Albedo), (*Ice, Albedo), Oceans, Reflection, Optical instruments, Airborne, Marine meteorology, USSR.

The article examines albedo of snow and ice with respect to stationary observations on Cape Sterlegov, and also generalizes the results of investigations of the reflecting power of snow-ice layer from aboard an aircraft. Knowledge of these questions is necessary when solving a number of problems in the areas of meteorology, ice flow, and ice forecast. (Author)

N66-24876 **Field 8L**
CFSTI Prices HC$1.00 MF$0.50
Defence Research Board, Ottawa (Ontario).
STRUCTURE OF SEA ICE OF GREAT THICKNESS.
by N. V. Cherepanov. Jan 66, 13p T-448-R
Transl. Into English From Tr. Arkticheskogo I Antarkt. Nauchno- Issled. Inst. (Leningrad), V. 267, 1964 P 13-18

Descriptors: Arctic, *Arctic ocean, Crystal, *Crystal structure, Density, *Ice, Inclusion, Island, Ocean, Petrography, *Polar region, Salt, Sea, Structure.

For abstract, see S 04 13.

PB-170 693 **Field 8L**
CFSTI Prices: HC$5.00 MF$1.00
Allied Research Associates, Inc., Concord, Mass. ARACON Geophysics Div.
SNOW COVER DISTRIBUTION AS MAPPED FROM SATELLITE PHOTOGRAPHY.
Final rept.
by James C. Barnes, and Clinton J. Bowley. May 66, 166p Rept. no. 8G25-F
Contract Cwb-11269

Descriptors: (*Mapping, Snow), (*Snow, Mapping), Scientific satellites, Aerial photography, Terrain, Missouri, Mississippi.

Satellite photographs from three winter seasons are analyzed to determine if snow cover distributions in the flat terrain of the Missouri and Upper Mississippi River Basin area can be usefully mapped from satellite photography. Techniques for the identification of snow cover, and for the differentiation between snow and cloud cover, are developed. Based on these techniques, snow distribution maps are prepared from some 40 orbital passes of TIROS and ESSA data. Comparisons are made between the satellite observed snow cover distributions and conventionally acquired snow data. The results of the study indicate that snow cover can be reliably identified from satellite photography, with snow depths of one-inch or more generally appearing as continuous snow cover. Sufficient detail in the snow pattern can be recognized to allow mapping in individual river basins as small as about 400 square miles. In non-forested regions, areas with snow depths of approximately three inches or less have reflectivities lower than areas with greater depths in nearly all cases. In forested regions, there is no discernible variation in reflectivity with snow depth. (Author)

PB-172 898 **Field 8L**
CFSTI Prices: HC$1.60 MF$0.50
Forest Service, Washington, D. C.
SNOW ACCUMULATION AND MELT IN RELATION TO TERRAIN IN WET AND DRY YEARS.
by Henry W. Anderson, and Allan J. West. 1965, 11p

Descriptors: (*Snow, *Terrain), California, Factor analysis, Multivariate analysis, Atmospheric precipitation.

The paper reports on an analysis of snow data from 163 snow courses in the central Sierra Nevada in California by factor analysis and principal component regression analysis. It includes recommendations on how the results can be interpreted in terms of their implication on how to locate representative snow courses. (Author)

8M. SOIL MECHANICS

AD-639 061 **Field 8M, 8J**
CFSTI Prices: HC$2.00 MF$0.50
Naval Civil Engineering Lab., Port Hueneme, Calif.
CONSOLIDATION CHARACTERISTICS OF PURE CLAYS AND PELAGIC SEDIMENTS.
Final technical rept., Jul 63-Jun 64.
by John P. Nielsen. Sep 66, 42p TR-R-477
Proj. Y-R011-01-01-066

Descriptors: (*Clay, Soil Mechanics), (*Soil mechanics, Ocean bottom sampling), Sedimentation, Marine geology, Mathematical models, Clay minerals, Compressive properties.

The study investigates the validity of the power law for expressing the viscous resistance to compression observed in clays and shows that it can be satisfactorily used for this purpose. However, it is suggested that the three-parameter Ellis model might better describe viscous resistance to compression. It is also shown that the constants appearing in the power law can be related by means of simple equations to the effective normal pressure and to the chemical composition of the clay mineral. Consolidation studies on pelagic sediments indicate that these are highly compressible and normally consolidated. Structures founded on these sediments will be subject to large settlements. (Author)

AD-639 146 **See Field 19D**

8N. TERRESTRIAL MAGNETISM

AD-639 327 **Field 8N**
CFSTI Prices: HC$1.00 MF$0.50
Air Force Cambridge Research Labs,, L. G. Hanscom Field, Mass.
A SYSTEM FOR MEASURING VECTOR MAGNETIC FIELDS FROM SOUNDING ROCKETS.
Instrumentation papers.
by P. G. Forsyth, and R. O. Hutchinson. Aug 66, 13p AFCRL-66-565, AFCRL-IP-105
Proj. AF-7601
Task 760103

Descriptors: (*Terrestrial magnetism, Measurement), Sounding rockets, Magnetic fields, Magnetometers, Telemeter systems, Data processing systems, Height finding.

Tests of a newly designed operational system show that the earth's vector magnetic field can be measured from a sounding-rocket nose cone by (a) determining the attitude of a rocket nose cone by means of an electromagnetic attitude-sensor using antenna-array signal-strength patterns; (b) making vector magnetic measurements within the rocket nose cone by means of switched bias coils and a cesium vapor magnetometer; (c) encoding and telemetering the resulting information in a format compatible with the existing facilities; and (d) developing computational techniques for reducing the data obtained from the system. (Author)

AD-639 613 **Field 8N**
CFSTI Prices: HC$5.00 MF$1.00
Alaska Univ., College. Geophysical Inst.
STUDY OF GEOMAGNETIC MICROPULSATIONS.
Final rept.
by Charles R. Wilson, and John O. Annexstad. Aug 66, 156p UAG-R-183
Contract Nonr-3010 (02)

Descriptors: (*Terrestrial magnetism, Scientific research), Ionosphere, Aurorae, Alaska, Pacific Ocean Islands, Statistical analysis.

Identifiers: Power spectral density, Macquarie Island.

Over 800 vector diagrams representing the locus of end points of the perturbation vector in three orthogonal planes (H-D, H-Z, D-Z) were constructed from the rapid run magnetograms of Pg micropulsations observed at College, Alaska and Macquarie Island during 1963 and 1964. The characteristics of Pg's as noted from these vector diagrams are the sense of rotation of the perturbation vector, the shape and orientation of the vector diagrams, and the symmetry relationships between the vector diagrams at conjugate points. The physical characteristics of Pg events observed at conjugate points that were investigated are time and frequency of occurrence, period and amplitude of the components, power spectral density and dispersion of the waves. The vector diagrams of Pg micropulsations are related to the vector diagrams predicted by a model of a rotating ionospheric current induced by standing transverse hydromagnetic waves. The predictions of this model agree with the observed shapes and orientations of the vector diagrams and the sense of rotation of the perturbation vector in the three orthogonal planes of Pg events. The characteristics of the Pg micropulsation as determined in this thesis indicate that Pg's are caused by transverse hydromagnetic waves propagating along the field lines to high latitude conjugate points. (Author)

N66-24231 **Field 8N**
CFSTI Prices HC$3.00 MF$0.75
Kyoto Univ. (Japan).
CATALOGUE OF DATA IN THE WORLD DATA CENTER C2 FOR GEOMAGNETISM.
Feb 66, 80p

Descriptors: Bibliography, Catalog, Center, Current, Data, Earth, *Earth current, *Geomagnetism, Magnetogram, World, *World data center.

For abstract, see S 04 13.

N66-26247 Field 8N
CFSTI Prices HC$4.00 MF$0.75
Smithsonian Astrophysical Observatory, Cambridge, Mass.
GEOMETRIC STRUCTURE OF THE EARTH'S GRAVITATIONAL FIELD AS DERIVED FROM ARTIFICIAL SATELLITES.
by W. Kohnlein. 28 Jan 66, 120p NASA-CR-75094, SAO SPECIAL REPT.-198
Grant NSG-87-60

Descriptors: Constant, *Earth, Field, *Geometry, Gradient, Gravitational, *Gravitational field, Map, Measurement, Potential, Satellite, *Satellite measurement, Structure, Table, Zone.

For abstract, see S 04 14.

N66-34796 Field 8N
CFSTI Prices HC$2.00 MF$0.50
Smithsonian Astrophysical Observatory, Cambridge, Mass.
ON THE GRADIENT LINE OF THE EARTH'S ZONAL GRAVITATIONAL POTENTIAL.
by W. Kohnlein. 1 Jul 66, 27p NASA-CR-77178, SAO SPECIAL REPT.-216
Grant NSG-87

Descriptors: Asymptote, Coefficient, Curvature, Direction, Field, *Gradient, Gravitational, *Gravitational potential, Gravity, Harmonics, Line, Potential, *Zonal harmonics, Zone.

For abstract, see S 04 20.

N66-34987 Field 8N
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MAGNETIC STORMS IN THE EARTH'S MAGNETIC TAIL.
by K. W. Behannon, and N. F. Ness. Oct 65, 98p NASA-TM-X-57212, X-612-65-417
Submitted For Publication

Descriptors: Activity, Data, Disturbance, Earth, Field, Geomagnetic, *Geomagnetic storm, Imp, Magnetic, *Magnetic field, Measurement, Observation, Solar, Storm, Tail.

For abstract, see S 04 20.

N66-35182 Field 8N
CFSTI Prices HC$1.00 MF$0.50
California Univ., Los Angeles.
TESTS OF SATELLITE DETERMINATIONS OF THE GRAVITY FIELD AGAINST GRAVIMETRY AND THEIR COMBINATION.
by W. M. Kaula. 1966, 34p NASA-CR-77494
Grant NSG-216
Its Publ.-508

Descriptors: Analysis, Anomaly, Camera, Determination, Field, Gravimetry, *Gravitational field, Gravity, Mathematics, Mean, Orbit, *Orbit perturbation, Perturbation, Satellite, *Satellite orbit, Solution, Square, Standard, Test, Tracking.

For abstract, see S 04 20.

AD-639 436 See Field 20H

AD-639 463 See Field 3B

9. ELECTRONICS AND ELECTRICAL ENGINEERING

N66-26664 Field 9
CFSTI Prices HC$7.00 MF$1.75
Massachusetts Inst. Of Tech., Cambridge.
RESEARCH LABORATORY OF ELECTRONICS QUARTERLY PROGRESS REPORT NO. 80.
by G. G. Harvey, and H. J. Zimmermann. 15 Jan 66, 314p NASA-CR-75149
Contract NSR-22-009-120, Grant NSG-496

Descriptors: Abstract, Acoustics, Communication, *Communication theory, Conversion, Dynamics, Energy, Information, *Information processing, *Neurophysiology, *Physics, Plasma, *Plasma dynamics, Processing, Program, Theory, University, *University program.

For abstract, see S 04 14.

N66-26778 Field 9
CFSTI Prices HC$2.00 MF$0.50
Technisch Documentatie En Informatie Centrum Voor De Krijgsmacht, The Hague (Netherlands).
REVIEW OF LITERATURE ON ELECTROTECHNOLOGY.
Literatuuroverzicht Electrotechniek
21 Apr 66, 33p
In Dutch, French, German, And English Its Vol. 15, No. E-485

Descriptors: *Abstract, Annotation, *Bibliography, Computer, *Computer programming, Control, Electromagnetic, *Electromagnetic radiation, Electronic, Information, *Information processing, Instrumentation, Microwave, Processing, Programming, Radiation, Reliability, *Telecommunication.

For abstract, see S 04 14.

9A. COMPONENTS

AD-475 773 Field 9A
CFSTI Prices: HC$4.00 MF$1.00
Microwave Electronics Corp., Palo Alto, Calif.
DEVELOPMENT OF ELECTRON GUN WITH NON-INTERCEPTING GRIDS.
Rept. no. 8 (final) 14 May 63-30 Aug 65.
by Marshall McDonald, Joseph Drees, Norman H. Pond, and Allan W. Scott. 30 Aug 65, 147p
Contract DA-36-039-AMC-02270 (E)
Proj. DA-1P6-22001-A-055-04
See also AD-467 595.

Descriptors: (*Electron guns, Design), Electrodes, Manufacturing methods, Triodes, Electron beams, Traveling-wave tubes, Focusing, Tests, Magnetic fields, Cathodes (Electron tubes).

A technique for making non-intercepting gridded guns has been developed using a pair of aligned grids. One grid is placed on or slightly off the cathode. This grid operates at cathode potential and shields the other control grid from interception. By this technique, control-grid interception can be reduced from 20 percent--which is the geometric shielding area of the grids--to less than 0.5 percent of the cathode current. As a result, grid-pulser current requirements and grid average power handling capability are improved by more than an order of magnitude. Use of the aligned-grid pair has no more effect on electron-beam shape than the single intercepting control grid. The amplification factor of the aligned-grid pair is approximately the same as that of a single intercepting control grid. (Author)

AD-638 816 Field 9A, 9B
CFSTI Prices: HC$3.00 MF$0.50
Massachusetts Inst. of Tech., Cambridge. Electronic Systems Lab.
AN ANALOG PHOTORESISTIVE MULTIPLIER.
Final rept. May-Dec 65.
by Mark E. Connelly. May 66, 50p
Contract AF 33 (615)-2923
Proj. AF-6114
Task 611408
AMRL-TR-66-71

Descriptors: (*Photomultipliers, *Analog computers), Illumination, Incandescent lamps, Phototubes, Resistors, Analog-digital computers, Flight simulators.

Identifiers: Photoresistive multipliers.

An inexpensive, yet accurate, analog multiplier producing seven products of a common variable has been developed and tested successfully. The device utilizes resistance variations in an array of eight photoresistive cells illuminated by a single incandescent lamp, the light level of which is controlled by the common multiplier. Three specific configurations are discussed in this report; two are four-quadrant multipliers and the third is a two-quadrant multiplier. The use of the latter in analog division is also treated. Static accuracies for the three configurations range from 0.1 percent to 0.25 percent relative to full-scale plus or minus 10 volts. The cell history, voltage, and temperature characteristics and the frequency response of the cell and lamp are discussed in detail. (Author)

AD-638 821 Field 9A
Not available from CFSTI.
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
MAXIMUM GAIN FET CONFIGURATIONS.
Physical sciences research papers, (revised ed.).
by B. Buchanan, S. Roosild, and R. Dolan. 3 Mar 66, 6p AFCRL-66-428, AFCRL-PSRP-240
Proj. AF-5638
Task 563802
Revision of manuscript submitted 14 Feb 66.
Availability: Published in Proceedings of the IEEE v54 n5 p802-3 May 19 1966.

Descriptors: (*Transistors, Gain), Configuration, Carriers (Semiconductors).

Identifiers: Field-effect transistors.

The results of deriving approximations to the transconductance expressions for junction field effect transistor configurations are presented in tabular form. Channels bounded by curved junctions are considered for both uniform and linearly graded charge densities. The results show that there is little difference if any between the transconductance expressions of FET configurations with uniform and linearly graded junctions. It is shown that one of the curved junction maximum gain configurations can be physically realized by lateral diffusion under a stripe mask. Experimental characteristics of laterally diffused devices are discussed. (Author)

AD-638 914 Field 9A, 20L, 13H
CFSTI Prices: HC$4.00 MF$1.00
Sperry Microwave Electronics Co., Clearwater, Fla.
PRODUCTION ENGINEERING MEASURE FOR YIG SPHERES AND LIMITERS.
Final rept., 29 May 63-21 Mar 66.
by R. L. Wickett, L. R. Hodges Jr. and D. E. Triby. 21 Mar 66, 132p SJ-222-0045-11
Contract DA-36-039-AMC-01477 (E)
See also AD-630 317.

Descriptors: (*Ferroelectric crystals, Manufacturing methods), (*Limiters, Manufacturing methods), (*Spheres, Single crystals), Yttrium compounds, Iron compounds, Garnet, Encapsulation, Ferromagnetic materials, Resonators, Microwave equipment.

Single crystal formulae, with accompanying firing methods and procedures were developed and successfully tested during this program. A high degree of reliability in meeting predicted magnetization and linewidth values has been demonstrated. Single crystal, spherical resonators were formed and polished in production quantities; they demonstrated the desired electrical characteristics necessary for use in the power limiters. Microwave power limiters, making use of the spherical resonators, were designed and fabricated in the four required bands. These power limiters exhibited the required electrical and environmental characteristics as called out in General Specification SCL-

5916A. Equipment and techniques necessary to form and polish YIG spheres was designed and fabricated during this program. This equipment was thoroughly tested and found to meet the program requirements. The limiter production run was performed, and 40 units were successfully assembled and tested using the design, assemble and test techniques developed for use on this program. The sphere production run produced 70 pure YIG and 70 GaYIG spheres of good quality, in the required diameters. The limiter and sphere production runs successfully demonstrated the capability of meeting the production requirements as outlined at the start of the program. (Author)

AD-639 067 **Field 9A**
CFSTI Prices: HC$3.00 MF$0.50
General Electric Co., Syracuse, N. Y. Electronics Lab.
ANALYSIS OF THE IMAGE DISSECTICON IMAGE TUBE.
by M. Namordi. Jul 66, 55p
Contract N123 (62738)54130 (X)

Descriptors: (*Image tubes, Analysis), Performance (Engineering), Electron tube parts, Images, Scattering.

A new type of low-light-level image tube called the image dissecticon is briefly described. In order to attain a better understanding of its operation and performance, a critical examination of the tube's constituent parts is made. The minimum level of detection as well as the performance of the dissecticon with an ideal disperser is determined. Finally, image dissecticon performance is characterized in terms of the disperser characteristics. These relationships are then used to determine dissecticon performance for specific typies of dispersers. Although this analysis is concerned solely with the image dissecticon, it is readily applicable to the performance determination of other low-light-level image devices. (Author)

AD-639 076 **Field 9A**
Not available from CFSTI.
Pittsburgh Univ., Pa. Sarah Mellon Scaife Radiation Lab.
CANCELLATION OF PHOTOMULTIPLIER GAIN DRIFT FOLLOWING SOURCE INTENSITY CHANGE.
by J. E. Brimhall, and L. A. Page. 1 Jun 65, 3p
AROD-3347:5
Availability: Published in Nuclear Instruments and Methods v35 p328-30 1965.

Descriptors: (*Photomultipliers, Gain), Corrections, Stabilization, Control systems, Performance (Engineering).

AD-639 108 **Field 9A, 9E, 13H**
CFSTI Prices: HC$1.00 MF$0.50
Lewis (E. B.) Co., Inc., East Hartford, Conn.
PRODUCTION ENGINEERING MEASURE CRYSTAL UNIT CR (XM-46A)/U.
Quarterly progress rept. no. 13, 1 Feb-1 May 66.
1 May 66, 22p
Contract DA-36-039-sc-86737
See also AD-632 698.

Descriptors: (*Crystal filters, Manufacturing methods), Performance (Engineering), Very high frequency, Quartz.

The plateback technique and its control of spurious responses as used on the preproduction samples is discussed. The data obtained on testing the preproduction samples is presented and the methods of test are discussed. Tests for aging present a problem and its solution by substituting the bridge circuit for the TS-683 test circuit is presented. (Author)

AD-639 357 **Field 9A**
CFSTI Prices: HC$1.00 MF$0.50
Edgerton, Germeshausen and Grier, Inc., Bedford, Mass. Systems Div.
DESIGN MODIFICATION AND CONSTRUCTION OF HIGH POWER DEUTERIUM THYRATRONS. PHASE 2.
Final technical rept.
by Nicholas Reinhardt. Sep 66, 13p B-3419
Contract NObsr-89405
Proj. SR0080301
Task 9434
See also AD-610 848.

Descriptors: (*Thyratrons, Design), (*Deuterium, Thyratrons), Construction.

AD-639 388 **Field 9A, 13H**
CFSTI Prices: HC$2.00 MF$0.50
Texas Instruments Inc., Dallas. Semiconductor-Components Div.
PRODUCTION ENGINEERING MEASURE (PEM) FOR TRANSISTOR, PNP, SILICON, SWITCHING TYPE EL-2N (X-12).
Quarterly rept. no 5, 25 Mar-25 Jun 66.
by Larry Lands. Aug 66, 49p Rept. no. 03-66-92
Contract DA-36-039-AMC-06160 (E)
See also AD-635 970.

Descriptors: (*Transistors, Manufacturing methods), Silicon, Quality control, Configuration.

Manufacturing process specifications were modified or rewritten to allow production of transistor type EL-2N (X-12) on a volume scale. The formalized process was used to fabricate the preproduction samples and to evaluate personnel and equipment requirements for the pilot production run. Pilot line production capability exceeded 200 transistors per 8 hour shift, the specified contract requirement. A quality control manual was prepared to govern the life, environmental, and mechanical tests of the PEM device. (Author)

AD-639 409 **Field 9A**
Not available from CFSTI.
New York Univ., N. Y.
SOME RESULTS FOR THIN-IRIS LOADED PERIODIC WAVEGUIDES.
Revised ed.
by D. Rosenberg, and D. J. R. Stock. 1 Dec 65, 9p
Grant DA-ARO (D)-31-124-G462
AROD-4155:3
Prepared in cooperation with Tennessee Univ., Knoxville. Revision of manuscript submitted 21 Apr 65.
Availability: Published in IEEE Transactions of Microwave Theory and Techniques vMTT-14 n3 p145-53 Mar 1966.

Descriptors: (*Waveguides, Mathematical analysis), Wave transmission, Admittance, Series, Operators (Mathematics).

The planar waveguide holding planar obstacles is a prototype structure--its fields correspond to some sets of lowest modes in circular and coaxial line waveguides that use coaxial iris loading and in inductive iris loaded rectangular guides. An analysis of a periodically thin-iris loaded planar waveguide is offered, the procedure for which can also be applied to the other waveguides mentioned. A particular example for small iris separation is considered. Among the results of this study are adjustments to some formulas of Brillouin so as to allow consideration of large phase shifts per cell of periodic guide. The procedure, which can be recommended as a formula deriving technique, can find use with such other planar obstacles as the thick periodic iris, the interdigitally placed irises, or the single iris in a multimode guide. Some consideration is given to interdigital loading. (Author)

AD-639 417 **Field 9A**
Not available from CFSTI.
National Research Council of Canada, Ottawa (Ontario). Div. of Applied Physics.
A PRECISION FEMTOFARAD CAPACITOR.
by D. M. Makow. 1966, 3p
NRC-9088
Availability: Published in Nature v210 n5043 p1350-1 Jun 25 1966.

Descriptors: (*Variable capacitors, Design), Canada, Capacitance, Spheres, Standards.

A capacitor was investigated which consists of six spheres, each with its centre on an axis of an orthogonal co-ordinate system and equidistant from the origin. The capacitance is measured between any two opposite spheres, while the remaining four and the shield are always at ground potential. This makes a three-terminal capacitor; the third terminal is the ground to which the shield and the non-active spheres are connected.

AD-639 431 **Field 9A, 13H**
CFSTI Prices: HC$2.00 MF$0.50
Piezo Technology Inc., Orlando, Fla.
PEM FOR FILTERS, UPPER SIDEBAND (1.75 Mc) QUARTZ CRYSTAL FILTERS TYPE EL-FR (X-1).
Quarterly progress rept. no. 5, 1 Jan-30 Jun 66.
by K. W. Callahan. 30 Jun 66, 27p
Contract DA-36-039-AMC-03636 (E)
See also AD-632 421.

Descriptors: (*Crystal filters, Manufacturing methods), (*Quartz, Radiofrequency filters), Medium frequency, Sidebands.

AD-639 432 **Field 9A, 11G, 13H**
CFSTI Prices: HC$3.00 MF$0.75
Sperry Microwave Electronics Co., Clearwater, Fla.
PRODUCTION ENGINEERING MEASURE FOR MICROWAVE FERRIMAGNETIC MATERIALS AND CIRCULATORS.
Quarterly progress rept. no. 1, 1 Feb-30 Apr 66.
by G. R. Harrison, W. C. Heithaus, and D. D. Summers. 30 Apr 66, 71p Rept. no. SJ-220-3999-4
Contract DA-36-039-AMC-06177 (E)

Descriptors: (*Ferromagnetic materials, *Microwave equipment), (*Waveguide circulators, Ferromagnetic materials), Manufacturing methods.

Ferrimagnetic materials were fabricated during the period for test and evaluation in each of the five frequency bands. Materials were prepared and evaluated in regard to their static and rf properties. The preparation and measured properties are discussed in detail in this report. In addition to material properties, measurement equipment being utilized on this program is described as well as new equipment being fabricated for bulk evaluation of circulator ferrimagnetic materials. Test structure design in three of the five bands (0.7-1.0 GHz, 5.4-5.9 GHz, and 8.2-12.4 GHz) progressed at a satisfactory rate. Test results indicate that additional work is required to bring the structures within specifications at the band edges. However, it was established that performance is reproducible and symmetrical from port to port. In the other two bands (2.0-4.0 GHz and 4.4-5.0 GHz) only minor refinements to existing structures will be required. (Author)

AD-639 433 **Field 9A, 20L**
CFSTI Prices: HC$2.00 MF$0.50
Radio Corp. of America, Somerville, N. J. Defense Microelectronics.
THIN-FILM POLYCRYSTALLINE FIELD-EFFECT TRIODE.
Quarterly rept. no. 7, 1 Jan-31 Mar 66.
by M. L. Topfer, J. J. Bowe, J. J. Fabula, W. H. Laznovsky, and R. L. Schelhorn. Sep 66, 44p
Contract DA-28-043-AMC-00231 (E)
Proj. DA-1P6-22001-A-056
Task 02
ECOM-00231-7
See also AD-634 088

Descriptors: (*Triodes, Semiconducting films), (*Transistors, Semiconducting films), Microstructure, Cadmium compounds, Sulfides, Selenides, Semiconductor devices.

Post-fabrication thermal processing was studied during this quarter. Thermal processing of a small number of experimental units showed that greatly improved gate insulator stability could be achieved. Problems of device yield and the dependence of achievable stability on the fabrication parameter of the device were recognized. A program was initiated to fabricate a large number of samples for testing purposes. A new TFT fabrication facility was put into operation to augment the present facility. Devices were fabricated and tested for the beginning of a life testing program of thermally processed units. Stability investigation on experimental TFT's were continued. Standard device stability testing of drain current variations with time was continued on recently fabricated units. Additional testing pertinent to device stability was initiated. These included gate capacitance measurements and gate impedance measurements. These tests were accomplished on unprocessed units. The work on photoemission into thin-film insulators has been used to study the energy band diagram of metal-insulator and semiconductor-insulator contacts. We have studied Al2O3, SiO, SiO2, and CaF2 in contact with Al, Au, and CdSe electrodes. The work on SiO and SiO2 is a continuation of last quarter's work and the results have been consistent with what has been previously reported. (Author)

AD-639 568 **Field 9A, 20L**
CFSTI Prices: HC$3.00 MF$0.75
Hewlett-Packard Co., Palo Alto, Calif.
HOT ELECTRON EMITTER.
Final rept. 8 Dec 64-7 Dec 65.
by D. M. Chang. Jul 66, 99p
Contract AF 19 (628)-4758
Proj. AF-4608
Task 460805
AFCRL-66-531

Descriptors: (*Semiconductor devices, Solid state physics), Triodes, Metal films, Band theory of solids, Manufacturing methods, Transport properties, Carriers (Semiconductors), Electrons.

A review of the physics that underlies semiconductor-metal-semiconductor triode operation is presented. The topics treated are: metal-semiconductor Schottky barrier emitters and collectors, hot electron transport in metal films, and hot electron reflection at the collector barrier. A revised estimate of the maximum frequency of oscillation for the SMS triode is obtained and the high frequency capabilities of SMS triodes are compared with those of the bipolar transistor on a broader basis. Finally, the various attempts at fabricating an SMS triode at this Laboratory are described. (Author)

AD-639 574 **Field 9A, 13H**
CFSTI Prices: HC$1.00 MF$0.50
Sprague Electric Co., North Adams, Mass.
PRODUCTION ENGINEERING MEASURE FOR IMPROVED RELIABILITY OF SOLID ELECTROLYTE TANTALUM CAPACITORS.
Quarterly rept. no. 12, 29 Mar-29 Jun 66.
by J. H. D. Folster, and E. J. Fresia. 29 Jun 66, 11p
Contract DA-36-039-AMC-03621 (E)
See also AD-636 775.

Descriptors: (*Tantalum capacitors, Manufacturing methods), Reliability (Electronics), Life expectancy, Leakage (Electrical).

New manufacture and testing of the 5.6 microfarad-35 V and 33 microfarad-35 V ratings were authorized during this period. The remaining seven ratings reached the 6000-hr readout point. Readings from a preselected statistically randomized sample are presented. (Author)

AD-639 588 **Field 9A, 13H**
CFSTI Prices: HC$5.00 MF$1.00
Cornell-Dubilier Electronics Div., Federal Pacific Electric Co., Norwood, Mass.
PRODUCTION ENGINEERING MEASURE FOR THE PRODUCTION OF SILICON MONOXIDE CAPACITORS MICROELEMENT.
Final rept., 29 May 63-29 Jul 66.
by Welville B. Nowak. 29 Jul 66, 177p
Contract DA-36-039-AMC-01478 (E)
See also AD-636 576.

Descriptors: (*Capacitors, Manufacturing methods), (*Ceramic capacitors, Silicon compounds), Monoxides, Microminiaturization (Electronics), Life expectancy, Performance (Engineering), Vacuum apparatus, Deposition, Dielectric films.

Identifiers: Silicon monoxide.

A pilot production process for fabricating SiO microelement capacitors at a rate of 2,000 per eight-hour shift was demonstrated and the products therefrom tested and shown to pass the required specifications. Each microelement (0.310 in. square) contains 1, 2, 3, or 4 capacitors with values of 1120 and 560, 180, 100, and 68 pf per capacitor, respectively. In addition to the general requirements of microelements and micromodules, some of the more important specifications are: dissipation factor (DF) < or = 1.5%, dielectric withstanding voltage = 150 volts, insulation resistance (IR) > 1000 megohms at 50 volts and 25 C and > 75 megohms at 125 C, Delta C/C < or = 15% (-55 to +125 C), and a long term life test of 2000 hours at 125 C and 100 volts after which DF < or = 3% and IR (25 C) > 200 megohms for 560 pf and > 750 megohms for 180, 100 and 68 pf units and IR (125 C) > 20 megohms for 500 pf and > 50 megohms for other capacitance values. The capacitors are vacuum deposited in a multi-station jig using ac heated evaporation sources. The alumina ceramic substrates were metalized with Au-Pt at the peripheral terminations and the interior area was glazed, using a fritted-glass tape. The aluminum electrodes are about 5000 A thick and the SiO dielectric is about 16,000 A thick. Deposition rates are about 50 A/sec. Rates and film thicknesses are monitored and controlled. Vacuum chamber pressure is 1 to 4 x 10 to the minus 5th power torr. Substrate temperature is 170 C during depositions. Yields of about 90% were achieved. (Author)

AD-639 610 **Field 9A, 13H, 18F**
CFSTI Prices: HC$4.00 MF$1.00
Tung-Sol Electric, Inc., Bloomfield, N. J. Electron Tube Div.
ELECTRON TUBES RADIATION RESISTANT PILOT LINE PRODUCTION.
Final progress rept. 21 May 63-31 Mar 66.
by William A. Buchanan. 10 Jun 66, 137p
Contract DA-36-039-AMC-01476 (E)

Descriptors: (*Shielding, Electron tubes), (*Electron tubes, Manufacturing methods), Nuclear particles, Aluminum compounds, Silicates, Glass, Encapsulation, Seals, Reliability (Electronics), Life expectancy, Radiation damage.

During the contract period all work required for the delivery of engineering samples, tube types 5886, 6360, 6205, and 6080WB, was completed with the exception of the high temperature (500 C) life testing of tube types 6360, 6205 and 5886 in alumino-silicate glass. The primary objective of the contract - to establish the techniques and controls for producing tubes with alumino-silicate enclosures - has been achieved. As a result of the information gained from the radiation tests and high temperature life tests, it became apparent that further efforts to establish pilot run capabilities would not be feasible. (Author)

NBS-M-96 **Field 9A**
CFSTI Prices: HC$1.25 MF$0.75
National Bureau of Standards, Boulder, Colo. Inst. for Basic Standards.
ELECTRICAL PARAMETERS OF PRECISION, COAXIAL, AIR-DIELECTRIC TRANSMISSION LINES.
by Robert E. Nelson, and Marlene R. Coryell. 30 Jun 66, 103p
Availability: Also available from Superintendent of Documents, GPO, Washington, D. C., 20402, $1.25 as C13.44:96.

Descriptors: (*Coaxial cables, Electrical properties), Transmission lines, Air, Dielectrics, Graphics, Inductance, Resistance (Electrical), Electrical impedance, Attenuation, Phase shift.

Since precision coaxial connectors have become commercially available, precision, coaxial, air-dielectric transmission lines are being widely used as radio frequency immittance standards. The evaluation of seven electrical parameters for four different line sizes, which are commonly used as standards, are presented in graphic form. The seven parameters, evaluated as functions of frequency, are inductance per inch, resistance per inch, characteristic impedance magnitude, characteristic impedance phase angle, attenuation per inch, phase-shift per inch, and wavelength. Also included are graphs showing how these parameters vary with changes in the resistivity of the conductors, the relative dielectric constant of air, and the diameters of the conductors. (Author)

NBS-TN-336 **Field 9A**
CFSTI Prices: HC$0.30 MF$0.50
National Bureau of Standards, Boulder, Colo. Radio Standards Lab.
CALCULATION OF THE ADMITTANCE OF A PARALLEL PLATE CAPACITOR CONTAINING A TOROID-SHAPED SAMPLE.
by Eric G. Johnson Jr. 21 Apr 66, 38p
Also available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.30.

Descriptors: (*Capacitors, Admittance), Magnet coils, Permeability (Magnetic), Numerical analysis, Programming (Computers).

Identifiers: FORTRAN.

The theoretical admittance of a toroid-shaped sample in a parallel plate capacitor system is developed. This calculation represents a first and second order perturbation correction to the usual quasistatic formula. The FORTRAN listing of the machine program is included. The analysis is done under the condition that the sample is not in contact with the capacitor plates and can be described by a complex permeability, mu sub M, and complex permittivity, epsilon sub M. (Author)

N66-24879 **Field 9A, 14B**
CFSTI Prices HC$5.00 MF$1.25
Industrial Science And Technology Agency, Tokyo (Japan).
SYNTHETIC TESTING METHOD AND TESTING CIRCUIT FOR SHORT LINE FAULTS OF CIRCUIT BREAKERS.
by I. Todoriki. 1964, 181p
In Japanese, English Summary Its Res. Of The Electrotech. Lab., No. 651

Descriptors: Breaker, Circuit, *Circuit breaker, Current, Electric, Fault, Line, Method, Short, Synthetic, Test, *Test method, Voltage.

For abstract, see S 04 13.

N66-24890 **Field 9A**
CFSTI Prices HC$2.00 MF$0.50
Institut Franco-allemand De Recherches, St. Louis (France).
INSTALLATION OF A LIGHTENING RADIOGRAPH ("FEXITRON 300 K V") AND THE STUDY OF X-RADIATION PRODUCED BY A FIELD EMISSION TUBE.
Mise En Service D'un Appareil De Radiographie-eclair ("felitron" 300 kv) Et Etude Du Rayonnement X Produit Par Un Tube A Emission De Champ
by F. Jamet. 22 Jan 64, 36p ISL-T-3/64
In French

Descriptors: Absorption, Diode, Discharge, Electric, *Electric measurement, Emission, Equipment, Field, *Field emission, Flash, Focus, Gas, Measurement, Oscillograph, Photography, *Radiation, Release, Spark, *Spark discharge, Tube, X-ray, *X-ray equipment.

For abstract, see S 04 13.

N66-24949 **Field 9A**
CFSTI Prices HC$5.00 MF$1.00
Lockheed Missiles And Space Co., Sunnyvale, Calif.
INTEGRITY OF ELECTRICAL CONNECTIONS COMPLETION REPORTS FOR SUBTASKS D,E,F, AND G.
by L. D. Brown. Dec 65, 164p NASA-CR-74744, LMSC-A764519
Contract NAS8-11475

Descriptors: Circuit, Component, *Component reliability, Connection, Electric, *Electric insulation, Equipment, Fatigue, Insulation, Material, *Material testing, Plastic, Reliability, Resistance, Solder, Storage, Testing, Vinyl.

For abstract, see S 04 13.

N66-24951 **Field 9A**
CFSTI Prices HC$1.00 MF$0.50
Texas Instruments, Inc., Dallas.
DESIGN, DEVELOPMENT AND DELIVERY OF ONE (1) BREADBOARD AND THREE (3) PRODUCTION UNITS OF A 75 VA INTEGRATED STATIC INVERTER MONTHLY PROGRESS REPORT NO. 10, FEB. 1966.
by L. L. Glover, L. A. Hahn, P. F. Newcomb, and J. P. Vergez. 1966, 14p NASA-CR-74763, SC0301-366
Contract NAS8-11925

Descriptors: Alloy, Array, Breadboard, Ceramics, Circuit, Counter, *Electronic equipment, Flip-flop, Header, Integration, Inverter, Mask, Power, Semiconductor, Silicon, Static, *Static inverter, Transistor, *Transistor circuit.

For abstract, see S 04 13.

N66-25308 **Field 9A**
CFSTI Prices HC$3.00 MF$0.75
Johns Hopkins Univ., Baltimore, Md.
A TECHNOLOGY OF TUNNEL DEVICES FOR MILLIMETER- WAVE APPLICATIONS.
by L. E. Dickens. May 66, 80p NASA-CR-497
Contract NAS5-3546

Descriptors: Amplifier, Arsenide, Back, Circuit, Device, Diode, Display, Fabrication, Gallium, Germanium, Junction, Millimeter, *Millimeter wave, N type, Oscillator, P type, *Receiver, Semiconductor, *Semiconductor device, Technique, Tunnel, *Tunnel diode, Wave.

For abstract, see S 04 13.

N66-25543 **Field 9A**
CFSTI Prices HC$2.00 MF$0.50
Westinghouse Electric Corp., Baltimore, Md.
DEVICE ANNEALING STUDIES FINAL PROGRESS REPORT, 1 APR. - 30 SEP. 1964.
by J. Grossman. 1964, 27p NASA-CR-74948
Contract NAS5-2755

Descriptors: Alloy, *Annealing, Bipolar, Furnace, Glass, High gain, Hydrogen, Lead, Low power, Nitrogen, Oxide, Stability, *Transistor, *Wafer.

For abstract, see S 04 14.

N66-26148 **Field 9A**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
AN AMPLIFIER FOR USE WITH SOLID STATE RADIATION DETECTORS IN SPACECRAFT APPLICATIONS.
by J. H. Marshall. 30 Oct 64, 23p NASA-CR-74885, JPL-TM-33-190
Contract NAS7-100

Descriptors: *Amplifier, Charge, Circuit, Design, Detector, Device, Drift, Gain, Instrumentation, Operation, Radiation, *Radiation detector, Sensitivity, Solid, *Solid state device, Spacecraft, *Spacecraft instrumentation, Stability, State.

For abstract, see S 04 14.

N66-26240 **Field 9A**
CFSTI Prices HC$4.00 MF$0.75
Electro-optical Systems, Inc., Pasadena, Calif. Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
HIGH TEMPERATURE ZERO DROP THYRATRON TUBE PROGRAM, PHASE I FINAL REPORT.
by W. J. Kearns. 1 Feb 66, 118p NASA-CR-74917, EOS-7016-FINAL-I
Contracts NAS7-100, JPL-951352
Prepared For Jpl

Descriptors: Circuit, Conditioning, Converter, Drop, *Generator, High temperature, Power, System, Thermionic, *Thermionic converter, *Thyratron, Transformer, Tube, Zero.

For abstract, see S 04 14.

N66-26245 **Field 9A**
CFSTI Prices HC$5.00 MF$1.00
Texas Instruments, Inc., Dallas.
STUDY OF SOLID-STATE INTEGRATED MICROWAVE CIRCUITS SCIENTIFIC REPORT NO. 1, 15 SEP. - 14 DEC. 1965.
31 Dec 65, 170p NASA-CR-71926, U4-811500-4
Contract NAS12-75

Descriptors: Circuit, Component, Device, Diode, Ferrite, Film, Filter, *Integrated circuit, Integration, Microwave, *Microwave circuit, Semiconductor, Solid, *Solid state device, State, Technique, Thin, Transistor, Varactor.

For abstract, see S 04 14.

N66-26661 **Field 9A**
CFSTI Prices HC$3.00 MF$0.75
Westinghouse Electric Corp., Los Angeles, Calif.
DEVELOPMENT AND FABRICATION OF A HIGH POWER SILICON SWITCHING TRANSISTOR FINAL REPORT, AUG. 1965 - APR. 1966.
by T. C. New. 1966, 89p NASA-CR-75133
Contracts NAS7-100, JPL-951303
Prepared For Jpl

Descriptors: Ampere, Collector, Component, Diagram, Drop, Element, Encapsulation, Epitaxy, Growth, High current, Low voltage, *Saturation, Silicon, *Silicon transistor, Switching, *Switching element, Transistor.

For abstract, see S 04 14.

N66-26760 **Field 9A**
CFSTI Prices HC$7.00 MF$1.75
Battelle Memorial Inst., Columbus, Ohio.
A STUDY OF THE EFFECT OF SPACE RADIATION ON SILICON INTEGRATED MICROCIRCUITS, VOLUME II FINAL REPORT, 22 JUN. 1964 - 26 SEPT. 1965.
1965, 331p NASA-CR-72216
Contract NAS5-3985

Descriptors: Circuit, Configuration, Diagram, Effect, Electron, Environment, Information, *Integrated circuit, Integration, Level, Logic, *Microcircuit, Monitor, Output, Radiation, *Radiation effect, *Silicon, Simulation, Space, Test.

For abstract, see S 04 14.

N66-26767 **Field 9A**
CFSTI Prices HC$1.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
A TUNNEL DIODE THRESHOLD DISCRIMINATOR AND PULSE SHAPER.
Un Discriminatore-formatore D'impulsi A Diodi Tunnel
by C. Felici. 5 May 65, 20p ISS-65/12
In Italian, English Summary

Descriptors: Amplitude, Circuit, Diode, *Discriminator, Energy, Frequency, High, Input, Physics, Pulse, *Pulse amplitude, Semiconductor, Threshold, Tunnel, *Tunnel diode, Value, Work.

For abstract, see S 04 14.

N66-26845 **Field 9A**
CFSTI Prices HC$7.00 MF$1.75
General Electric Co., Syracuse, N. Y.
RESEARCH TO DETERMINE FAILURE MODES FOR TRANSISTORS.
by B. Bair. 1965, 339p NASA-CR-75304
Contract NAS8-11059

Descriptors: Analysis, Bias, Centrifugal, Dissipation, Failure, *Failure mode, Life, Mode, Planar, Power, *Reliability, Screening, Shock, Strain, Stress, *Stress analysis, Temperature, Testing, *Transistor, Vibration.

For abstract, see S 04 14.

N66-26850 **Field 9A**
CFSTI Prices HC$3.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EVALUATION OF COMMERCIAL TRAVELING WAVE TUBES FOR APPLICATION IN DIRECT RF TO RF TRANSPONDERS.
by I. C. Prillaman. 15 Mar 65, 53p NASA-TM-X-55478, X-625-65-46

Descriptors: Carrier, Communication, Gain, Modulation, Noise, Power, Satellite, *Satellite communication, *Transponder, Travel, *Traveling wave tube, Tube, Wave.

For abstract, see S 04 14.

N66-26851 **Field 9A**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TRAVELING WAVE TUBE DEVELOPMENT FOR A SERRODYNE RE-ENTRANT AMPLIFIER.
by W. K. Allen, L. J. Ippolito, and C. Prillaman. Apr 65, 74p NASA-TM-X-55479, X-625-65-47

Descriptors: *Amplifier, Amplitude, Circuit, Distortion, Electronic, *Electronic equipment, Equipment, Frequency, Generator, Modulation, Reentry, Sawtooth, Sideband, Travel, *Traveling wave tube, Tube, Wave, Waveform.

For abstract, see S 04 14.

N66-34206 **Field 9A**
CFSTI Prices HC$2.50 MF$0.75
Clevite Corp., Cleveland, Ohio.
THIN FILM PIEZOELECTRIC RESONATING DEVICE FINAL REPORT, 28 MAY 1965 - 28 JUL 1966.
by D. A. Roberts, and T. R. Sliker. 28 Jul 66, 88p NASA-CR-65458
Contract NAS9-4373

Descriptors: Cadmium, *Cadmium sulfide, Crystal, Deposition, Development, Electronic, Equipment, Film, *High frequency, Miniature, *Piezoelectricity, Product, *Resonator, Sulfide, Thin, *Thin film, Transducer, Vacuum.

For abstract, see S 04 20.

N66-34680 **Field 9A**
CFSTI Prices HC$2.00 MF$0.50
Itt Industrial Labs., Fort Wayne, Ind.
RESEARCH IN THE DEVELOPMENT EFFORT OF AN IMPROVED MULTIPLIER PHOTOTUBE SEVENTH QUARTERLY REPORT.
by F. H. Barr, and E. H. Eberhardt. 24 Jun 66, 37p
NASA-CR-77185, ITTIL-66-1037
Contract NASW-1038

Descriptors: Amplitude, Data, Distribution, Efficiency, Multiplier, *Photocathode, *Photomultiplier, Phototube, Pulse, *Pulse amplitude, Quantum, Radiation, Response, Size, Test, Time, *Time response, Uniform.

For abstract, see S 04 20.

N66-34704 **Field 9A**
CFSTI Prices HC$2.00 MF$0.50
Bendix Corp., Southfield, Mich.
STUDY TO INVESTIGATE THE EFFECTS OF IONIZING RADIATION ON TRANSISTOR SURFACES THIRD QUARTERLY REPORT, PERIOD ENDING, 31 MAR. 1966.
by D. L. Nelson, and R. J. Sweet. May 66, 41p
NASA-CR-77360
Contract NAS8-20135
Its Rept.-3434

Descriptors: Characterization, Device, Dose, Effect, Ionized, *Ionizing radiation, Radiation, *Radiation effect, Semiconductor, Surface, Temperature, *Transistor.

For abstract, see S 04 20.

N66-35240 **Field 9A**
CFSTI Prices HC$2.00 MF$0.50
Montana State Coll., Bozeman.
INVESTIGATIONS ON NONPARAMETRIC DISCRIMINATION THEORY AND PROCEDURES APPLICABLE TO PROBLEMS IN ELECTRONIC COMPONENT SCREENING. ON DISCRIMINATION PROBLEMS FINAL REPORT.
by M. Gessaman, and C. P. Queenberry. Aug 66, 47p NASA-CR-77478
Grant NSG-562

Descriptors: Component, *Discrimination, Distribution, Electronic, *Electronic equipment, Equipment, *Mathematical model, Mathematics, Model, Normal, Screening, *Screening technique, Technique, Tolerance.

For abstract, see S 04 20.

PB-170 987 **Field 9A, 14B**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
FIXED COAXIAL ATTENUATORS O TO 50DB 0.2 TO 10.0 GHz.
Technical manual instrument calibration procedure GA-05.
15 May 66, 32p
NAVWEPS-17-20GA-05
This publication supersedes the interim edition released by the Metrology Engineering Center on 1 Jul 1963 and NAVWEPS 17-20GA-05 dated 1 July 1965 changed 1 April 1966.

Descriptors: (*Attenuators, Calibration), Coaxial cables, Microwave frequency, Specifications, Test methods.

The procedure describes the calibration of fixed coaxial attenuators of values between 0 and 50 db at frequencies of 0.2 to 10 GHz, a partial list of which is given in the appendix.

PB-173 087 **Field 9A, 14B**
CFSTI Prices: HC$1.00 MF$0.50
SSCO Standards Lab., Inc., Southfield, Mich.
TRANSISTOR TEST SET TRANSISTOR ELECTRONICS TDT-200A.
Technical manual instrument calibration procedure, AY-20.
15 May 66, 11p
N123 (62861)35059A
NAVAIR-17-20AY-20

Descriptors: (*Transistors, Test sets), (*Test sets, Calibration), Diodes (Semiconductor), Rectifiers, Specifications, Test methods.

The procedure describes the calibration of the Transistor Test Set, herein referred to as the Test Instrument. The Test Set is used to test transistors, diodes and rectifiers under conditions simular to normal electronic applications. (Author)

AD-638 862 **See Field 18H**

AD-638 978 **See Field 20E**

AD-639 091 **See Field 9C**

AD-639 212 **See Field 13H**

AD-639 356 **See Field 11D**

AD-639 509 **See Field 9E**

AD-639 551 **See Field 9B**

AD-639 576 **See Field 12A**

N66-24414 **See Field 14B**

9B. COMPUTERS

AD-465 172 **Field 9B**
CFSTI Prices: HC$25.80 MF$1.25
Navy Electronics Lab., San Diego, Calif.
CONVERTER COMPENDIUM.
by H. A. Whitted. 15 Jun 65, 262p
Proj. SF-007-04-01
Task 7320, NEL-N40951
See also AD-471 870, AD-636 189.

Descriptors: (*Input-output devices, Specifications), (*Analog-to-digital converters, Specifications), (*Digital-to-analog converters, Specifications), Shafts, Synchros, Voice communication systems, Coding, Electrical properties, Physical properties, Data.

The compendium is based on in-house and commercial literature on the following types of converters: Shaft to digital (contact and noncontact), Analog to digital (excluding digital voltmeters), Digital to analog, Synchro to digital, Digital to synchro, and Voice to digital. Major functional, electrical, and physical characteristics of the converters are described. The data have been assembled and handled by machine methods in a format that permits additions, corrections, and deletions to be made with a minimum of effort. Programs for selective retrieval are planned using combinations of characteristics provided from the data base now maintained on magnetic tape.

AD-471 870 **Field 9B**
CFSTI Prices: HC$3.00 MF$0.50
Navy Electronics Lab., San Diego, Calif.
CONVERTER COMPENDIUM SUPPLEMENT.
by H. A. Whitted, and F. H. Wolfe. 15 Sep 65, 52p

Supplement to basic report available as AD-465 172.

Descriptors: (*Input-output devices, Specifications), (*Analog-to-digital converters, Specifications), (*Digital-to-analog converters, Specifications), Shafts, Synchros, Voice communication systems, Coding, Electrical properties, Physical properties, Data.

AD-638 748 **Field 9B**
CFSTI Prices: HC$3.00 MF$0.75
Adams (Charles W.) Associates, Inc., Cambridge, Mass.
APPLIED RESEARCH ON IMPLEMENTATION AND USE OF LIST PROCESSING LANGUAGES.
Final scientific rept., Jan 65-Jan 66.
by Roy M. Salzman, Thomas A. Flaherty, and Marlene E. Ponton. May 66, 78p
Contract AF 19 (628)-5026
Proj. AF-4641
Task 464102
AFCRL-66-364

Descriptors: (*Programming languages, Scientific research), Compilers, Computers, Display systems, Programming (Computers).

Identifiers: List processing, Floating-point operation, LISP.

The report contains a summary of the five major tasks performed during the one-year duration of the contract. The work performed consisted of: (1) a variable-precision floating-point package for the solution of problems requiring very high precision, (2) extension of and improvements to the software system developed under an earlier contract, (3) assistance in the implementation and validation of a LISP Compiler, (4) development of a program for powerful manipulation of symbolic text (TECO), and (5) specification of a set of generalized display routines for visual communication with the computer. All work done related to the M-460 research computer at AFCRL. (Author)

AD-638 894 **Field 9B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
HOW ELECTRONIC COMPUTING MACHINES WORK.
by N. Kanivets. 18 Apr 66, 15p FTD-TT-65-1718
TT-66-62242
Unedited rough draft trans. of Nauka i Tekhnika (Latvian SSR), n2 p7-9, 31 1965.

Descriptors: (*Digital computers, Operation), Data processing systems, State-of-the-art reviews, USSR.

AD-639 166 **Field 9B**
CFSTI Prices: HC$4.00 MF$1.00
Stanford Univ., Calif. Dept. of Computer Science.
AN APPROACH TO COMPUTER LANGUAGE DESIGN.
Technical rept.
by W. M. McKeeman. 31 Aug 66, 131p CS48
Contract Nonr-225 (37), Grant NSF-GP-4053
Proj. NR-044-211

Descriptors: (*Programming languages, Design), Compilers, Context free grammars, Syntax, Grammars.

The problem of an extendable compiler is approached by attempting to simplify the methods of generating a compiler and by designing a basic language upon which to build. A context-free grammar is required as the initial input to a syntax preprocessor which produces syntactic analysis tables for the extendable compiler. A formal mathematical description of a class of analysis algorithms, two new syntax preprocessor algorithms, and theorems concerning the behavior of the algorithms and the nature of the acceptable grammars are given. The EULER development of Wirth and Weber (EULER: A generalization of Algol and its formal definition. Technical report, CS20) is carried to a more concise and powerful form. We advocate languages that are minimal and involut-

ed. A minimal language combines into a single construct any two conceptually similar but notationally different constructs. An involuted language avoids constructs that are applicable only in local context. Control over the flow of execution within a program is obtained that is sufficiently complete so that the traditional label and go-to statement can be discarded as irrelevant. An extendable compiler is presented that is written in the kernel language itself. Conclusions are that the precedence grammar techniques are efficient and useful. Further improvement could make them substantially superior to other methods of compiler generation. (Author)

AD-639 167 **Field 9B, 5H**
CFSTI Prices: HC$2.00 MF$0.50
Mitre Corp., Bedford, Mass.
USER'S DESCRIPTION OF THE DD-13 DISPLAY CONSOLE CONNECTED TO PHOENIX.
by J. Mitchell. Jul 66, 43p MTR-175
Contract AF 19 (628)-5165
Proj. 508G
ESD-TR-66-104

Descriptors: (*Input-output devices, Display systems), (*Computers, Input-output devices), Typewriters, Coding, Cathode ray tubes, Computer storage devices, Computer logic, Man-machine systems.

Identifiers: PHOENIX (Computers).

The report describes the dd-13 display console, as it will be connected to the PHOENIX computer for the benefit of prospective users. (Author)

AD-639 301 **Field 9B, 12B**
CFSTI Prices: HC$2.00 MF$0.50
Cruft Lab., Harvard Univ., Cambridge, Mass.
OPTIMIZATION OF STOCHASTIC FINITE STATE SYSTEMS.
Technical rept.
by R. L. Kashyap. 20 Apr 66, 33p TR-499
Contract Nonr-1866 (16)
Proj. NR-372-012

Descriptors: (*Optimization, *Stochastic processes), (*Input-output devices, Optimization), Queueing theory, Computers.

Identifiers: Time sharing (Computers).

The paper is concerned with the determination of optimal policy under specified performance criteria for finite state systems, i.e., systems whose allowable state space consists only of a finite number of points. It was assumed that the state transitions occur at discrete instants of time t=0,1,2..t sub f. Moreover the attention is focused on stochastic finite state systems i.e., systems in which the state transitions are governed probabilistically by the given input. These systems are more amenable for simulation by digital computer than continuous state systems and have found application in various branches like learning theory, pursuit problems, time-sharing computer systems, the latter of which will be discussed later in the paper. The basic problem is to specify the input to the system at each instant so that the expected value of the sum of the cost of the system in the terminal state and the cost suffered by the system during the transition is minimized. Since the number of available inputs to the system is finite, the variational theory cannot be applied directly to the solution of such problems. Some of these problems, in which the state of the system at each instant can be measured exactly, have been analyzed with the aid of dynamic programming by a number of investigators like Bellman, Howard, Zadeh, and Eaton etc. The author rephrases and solves a larger class of problems, including those in which the state of the system cannot be measured exactly, with the aid of discrete maximum principle.

AD-639 352 **Field 9B, 8J**
CFSTI Prices: HC$3.00 MF$0.50
Woods Hole Oceanographic Institution, Mass.
A SHIPBOARD OCEANOGRAPHIC DATA PROCESSING AND CONTROL SYSTEM.
Technical rept.
by C. O. Bowin, R. Bernstein, E. Ungar, and J. R. Madigan. Aug 66, 58p WHOI-Ref-66-44
Contract Nonr-4029 (00)
Proj. NR-260-101

Descriptors: (*Data processing systems, *Oceanographic data), Shipborne, Gravity, Magnetic fields, Measurement, Oceanology.

In June of 1962 a digital computer (IBM 1710) was placed aboard the Research Vessel CHAIN of the Woods Hole Oceanographic Institution for real-time reduction of measurements of the earth's gravity and magnetic fields. This system has made it possible to automatically sample, compute, and record data concerning the ship's heading and speed, latitude and longitude, water depth, gravity in terms of total acceleration, free-air and Bouguer anomalies, and the magnetic field of the earth. The system was expanded in November 1963 to provide on-line plotting of bathymetric, gravity anomaly, and magnetic field profiles; computer control of gravity meter spring tension; processing of surface temperature measurements and ocean sound velocity measurements; display of ship's position and numerical data at remote stations aboard the ship and malfunction detection and alarm message generation. Experiments are being made using three remote input/output typewriters to improve collection, dissemination, and availability of scientific and navigational information logged during the course of a cruise. Three magnetic-disk storage units are used for data and program storage and provide the ability to merge real-time, on-line computations with background off-line computations (time-sharing).

AD-639 490 **Field 9B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
USING TWO-DIMENSIONAL FILTRATION OF IMAGES TO INCREASE THE RELIABILITY OF AUTOMATIC READING.
by V. P. Romanov. 17 Jun 66, 14p FTD-TT-65-1894
TT-66-62352
Unedited rough draft trans. of Nauchno-Tekhnicheskaya Informatisiya (USSR) n7 p24-6 1964.

Descriptors: (*Reading machines, Reliability), Signals, Automatic, Images, USSR, Cathode ray tubes, Photomultipliers.

Results are given of investigations of algorithms of the processing of images of machine recording signs, separation of edges and image angles, allowing one to realize suppression of noise, and also work results of separation algorithms of sign form elements - special points, rectilinear and curvilinear sections. (Author)

AD-639 551 **Field 9B, 9A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
FERRITE CORE MEMORIES.
by Josef Drasny, and Imre Molnar. 11 Aug 66, 25p FTD-TT-65-1307
TT-66-62358
Edited trans. of Meres es Automatika (Hungary) v12 n6 p189-95 1964.

Descriptors: (*Magnetic cores, *Data storage systems), Ferrites, Hungary.

AD-639 561 **Field 9B**
CFSTI Prices: HC$2.60 MF$0.50
RAND Corp., Santa Monica, Calif.
A SIMULATION MODEL FOR DATA SYSTEM ANALYSIS.
by Leon Gainen. 1 Mar 61, 21p P-2195

Descriptors: (*Data, Systems engineering), (*Data processing systems, *Simulation), Analysis, Feasibility studies, Management control systems.

Identifiers: Systems analysis.

The paper develops the thesis that data system designers can bring their profession closer to a predictive science. Only by adapting, for the purpose of data system analysis, analytical tools which make possible prediction and quantification of data system behavior within the management system structure can this be done. The paper discusses one such tool, a generalized data system model, and describes a technique of simulating dynamic system operation with such a model in order to provide the data system designer insights on the behavior to expect from the data system as it would operate. Some of the benefits possible through such simulation are explored. The paper concludes that the major use for the present of this analytical technique is to test the feasibility of a data system design before acquisition of actual hardware. (Author)

AD-639 562 **Field 9B**
CFSTI Prices: HC$1.60 MF$0.50
RAND Corp., Santa Monica, Calif.
THE ROLE OF DATA INPUT IN AUTOMATIC DATA PROCESSING SYSTEMS.
by Solomon L. Pollack. 9 Mar 61, 15p P-2246
Prepared for publication in Journal of Machine Accounting.

Descriptors: (*Data processing systems, Design), (*Input-output devices, Data processing systems), Computers, Errors, Data.

The paper contends that data-input problems can be dealt with most effectively if data-input techniques and equipment are made integral parts of an electronic data processing (EDP) system. Plans for data-input equipment and techniques should be developed concurrently with those for the EDP equipment and system design. The newer data-input techniques, such as character recognition by optical sensing or transmission of digital information over phone lines, can best be exploited if their use is considered while the data processing system is being designed, rather than being added as bits and pieces. (Author)

AD-639 586 **Field 9B**
CFSTI Prices: HC$2.00 MF$0.50
Mitre Corp., Bedford, Mass.
A METHOD FOR THE EVALUATION OF SOFTWARE. VOLUME I. GENERAL DESCRIPTION INCLUDING BENCHMARK CONSIDERATIONS.
by Arthur E. Budd. Aug 66, 44p MTR-197-Vol-I
Contract AF 19 (628)-5165
Proj. AF-8510
ESD-TR-66-113-Vol-I

Descriptors: (*Data processing systems, Effectiveness), (*Programming (Computers), Effectiveness), (*Programming languages, Effectiveness), Computers, Compilers, Input-output devices, Computer storage devices.

Identifiers: Sorting (Computers), Evaluation, Computer software.

The report contains a description of a method for evaluating software. Included is a detailed description of each of 14 measures of software capability used in the method. Benchmark program considerations are delineated as well as a guideline-questionnaire for demonstration reporting. The important features of each software category will be identified in future volumes. (Author)

NBS-TN-268 **Field 9B**
CFSTI Prices: HC$0.60 MF$0.75
National Bureau of Standards, Washington, D. C. Center for Computer Sciences and Technology.

TRANSISTORIZED BUILDING BLOCKS FOR DATA INSTRUMENTATION.
by Philip G. Stein. 28 May 66, 116p
Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60 as C13.46:268.

Descriptors: (*Computer logic, Transistors), (*Data processing systems, Computer logic), Digital systems, Design.

A fourth family of etched-circuit logic cards has been developed at the National Bureau of Standards. It closely parallels the design criteria and philosophy embodied in previous work, but differs in many respects. Each circuit description is separated physically from the others to facilitate use as an application manual. Specifications, typical uses, graphic symbols, and reliability are discussed in brief. (Author)

N66-24113 **Field 9B**
CFSTI Prices HC$2.00 MF$0.50
University Of Southern Calif., Los Angeles.
COMPUTING METHODS IN OPTIMIZATION PROBLEMS - GRADIENT METHODS FOR THE OPTIMIZATION OF DYNAMIC SYSTEM PARAMETERS BY HYBRID COMPUTATION.
by G. A. Bekey, and R. B. Mc ghee. 1963, 27p NASA-CR-71806
Contracts NGR-05-018-022, AF-AFOSR-75-63

Descriptors: Address, Algorithm, Analog, Computation, Computer, Criterion, Digital, Dynamic, Function, *Gradient, Hybrid, *Hybrid computer, *Mathematical model, Mathematics, Model, *Optimization, Response, System.

For abstract, see S 04 13.

N66-24589 **Field 9B**
CFSTI Prices HC$3.00 MF$0.75
Honeywell, Inc., St. Petersburg, Fla.
NASA PATTERN PROCEDURES MANUAL. PART I - APOLLO PAYLOAD EVALUATION.
by J. L. Kirk. 15 Jan 66, 99p NASA-CR-74615, AERO-8-20207-PM
Contract NAS8-20207

Descriptors: Computer, *Computer method, Decision, *Decision making, Experiment, Instruction, *Manual, Mathematics, Method, Payload, Program, Space, *Space program, Technique.

For abstract, see S 04 13.

N66-24601 **Field 9B**
CFSTI Prices HC$6.00 MF$1.25
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SFPRO - SINGLE PRECISION COWELL TRAJECTORY PROCESSOR.
by P. S. Fisher, R. A. Harris, N. S. Newhall, A. D. Rosenberg, and R. J. White. 15 Jan 65, 229p NASA-CR-74019, JPL-TM-33-199
Contract NAS7-100

Descriptors: Calculation, Computer, *Computer program, Digital, *Digital computer, *Ibm 7094 computer, Position, Program, Spacecraft, *Spacecraft tracking, Station, Tracking, *Tracking station, Trajectory, Velocity.

For abstract, see S 04 13.

N66-24692 **Field 9B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TEN BIT ANALOG TO DIGITAL CONVERTER.
by R. S. Lee. Feb 66, 17p NASA-TM-X-55459, X-614-66-59

Descriptors: Accuracy, Analog, *Analog-to-digital converter, Control, Converter, Digital, Filter, High, Optical, *Optical filter, Rocket, Sensitivity, Sounding, *Sounding rocket, Temperature, *Temperature control, Thermal.

For abstract, see S 04 13.

N66-25209 **Field 9B**
CFSTI Prices HC$1.00 MF$0.50
California Univ., Berkeley. Lawrence Radiation Lab.
ISO - A FORTRAN PROGRAM FOR UTILIZING THE STRONG-FOCUSING PRINCIPLE IN BETA-RAY SPECTROMETER DESIGN.
by H. Owens. 21 Oct 65, 16p UCRL-16471
Contract W-7405-ENG-48

Descriptors: Aberration, Azimuth, Beta, Computer, *Computer program, Dispersion, Equation, Field, *Focusing, *Fortran, Magnetic, Mathematics, Motion, *Motion equation, Particle, Program, Ray, Resolution, *Spectrometer, Transmission.

For abstract, see S 04 13.

N66-25628 **Field 9B**
CFSTI Prices HC$2.00 MF$0.50
India. Dept. Of Atomic Energy, Bombay.
CIR LOOP - A PROGRAM TO CALCULATE THE REACTIVITY LOAD AND RELATIVE POWER OUTPUT OF A LOOP IN CIR.
by K. R. Srinivasan, and P. V. Suryanarayanan. 1965, 38p AEET-237

Descriptors: Assembly, Central, Channel, Computer, *Computer program, Core, *Fortran, Fuel, Input, Load, *Loop, Power, *Power supply, Program, Reactivity, Reactor, Recording, Region, Supply.

For abstract, see S 04 14.

N66-26694 **Field 9B**
CFSTI Prices HC$2.00 MF$0.50
Brown Engineering Co., Inc., Huntsville, Ala.
THE GENERAL FUNCTIONAL RELATIONSHIP LANGUAGE SYSTEM.
30 Jun 64, 39p NASA-CR-75034
Contract NAS8-11027

Descriptors: Component, Computer, *Computer program, Data, Functional, *Functional integration, Integration, Language, *Language programming, Mathematics, Model, Output, Programming, Simulation, Space vehicle, Symbol, System.

For abstract, see S 04 14.

N66-26817 **Field 9B**
CFSTI Prices HC$1.00 MF$0.50
Alabama Univ., University.
A NONLINEAR ENCODER TECHNICAL REPORT NO. 1, 9 MAY - 9 SEP. 1964.
by C. C. Carroll, and H. Mott. Sep 64, 23p NASA-CR-75311
Contract NAS8-5341

Descriptors: Aperiodic, Circuit, Clock, *Comparator, Computer, Counter, Discontinuity, *Encoder, Inhibitor, Nonlinear, *Nonlinear programming, Programming, Pulse, Reference, Sinusoid, Time, *Voltage.

For abstract, see S 04 14.

N66-26880 **Field 9B**
CFSTI Prices HC$4.00 MF$1.00
Westinghouse Electric Corp., Baltimore, Md.
A COMPUTER PROGRAM FOR THE SIMULATION OF FAILURE-RESPONSIVE SYSTEMS TECHNICAL REPORT NO. 6.
by J. M. Hannigan. Apr 66, 131p NASA-CR-75277, WGD-38521
Contract NASW-572

Descriptors: Analysis, Chart, Computer, *Computer program, Failure, Flow, *Fortran, Language, Method, *Monte carlo method, Program, *Reliability, Response, Simulation.

For abstract, see S 04 14.

N66-34425 **Field 9B**
CFSTI Prices HC$2.50 MF$0.75
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AMTRAN HARDWARE - AN ELECTRONIC INTERFACE TO SIMPLIFY AND SPEED UP MAN MACHINE COMMUNICATION.
by C. A. Ely, J. Reinfelds, R. N. Seitz, and L. H. Wood. May 66, 99p NASA-TM-X-53343

Descriptors: Cathode, Communication, Control, Electronic, Hardware, *Ibm 1620 computer, Interface, Man-machine, *Man-machine system, *On-line programming, Oscilloscope, Programming, Ray, Remote, *Remote control, Simplification, System, Terminal, Typewriter.

For abstract, see S 04 20.

N66-34705 **Field 9B**
CFSTI Prices HC$2.00 MF$0.50
Planning Research Corp., Los Angeles, Calif.
A SURVEY OF SPACEBORNE COMPUTERS TECHNICAL ADVISEMENT MEMORANDUM NO. 171-1.
by G. Liviakis. 27 Jun 66, 28p NASA-CR-77359, PRC-D-1237
Contract NAS8-20367

Descriptors: Airborne, *Airborne equipment, Characteristics, Computer, *Computer design, Design, Equipment, Evaluation, Hardware, Performance, Spacecraft.

For abstract, see S 04 20.

N66-34791 **Field 9B**
CFSTI Prices HC$4.00 MF$0.75
Arinc Research Corp., Washington, D. C.
DESCRIPTION OF THE COMPUTERIZED RELIABILITY ANALYSIS METHOD (;CRAM) ARINC RESEARCH MONOGRAPH NO 11.
by D. E. Van tijn. 13 Nov 64, 104p NASA-CR-77414, PUBL.-294-02-14-444
Contract NAS8-11087

Descriptors: Analysis, Computer, *Computer method, Engineering, Failure, Input, Method, Probability, Program, *Reliability, Routine, Utility.

For abstract, see S 04 20.

N66-35040 **Field 9B, 20H**
CFSTI Prices HC$2.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
SAN 64 - A PROGRAM FOR SPATIAL RECONSTRUCTION OF EVENTS IN A TWO-VIEW DIFFUSION CHAMBER. PART IV - LIST OF INSTRUCTIONS.
San 64 - Un Programma Per La Ricostruzione Spaziale Di Eventi In Camera A Diffusione Con Due Viste. Parte Iv - Lista Della Istruzioni
by P. Salvadori. 14 Mar 66, 47p ISS-66/14
In Italian, English Summary

Descriptors: *Chamber, Computer, *Computer program, Diffusion, Elementary, *Elementary particle, Event, Ibm 7040 computer, Particle, *Particle track, Physics, Program, Reconstruction, Subroutine, Track.

For abstract, see S 04 20.

N66-35041 **Field 9B, 20H**
CFSTI Prices HC$3.00 MF$0.75
Istituto Superiore Di Sanita, Rome (Italy).
SAN 64 - A PROGRAM FOR SPATIAL RECONSTRUCTION OF EVENTS IN A TWO-VIEW DIFFUSION CHAMBER. PART I - GENERAL DESCRIPTION.

San 64 - Un Programma Per La Ricostruzione Spaziale Di Eventi In Camera A Diffusione Con Due Viste. Parte I - Descrizione Generale
by P. Salvadori. 14 Mar 66, 66p ISS-66/11
In Italian, English Summary

Descriptors: *Chamber, Computer, *Computer program, Diffusion, Elementary, *Elementary particle, Event, Formula, Ibm 7040 computer, Particle, *Particle track, Physics, Program, Reconstruction, Track.

For abstract, see S 04 20.

N66-35085 **Field 9B, 20H**
CFSTI Prices HC$4.00 MF$1.00
Istituto Superiore Di Sanita, Rome (Italy).
SAN 64 - A PROGRAM FOR SPATIAL RECONSTRUCTION OF EVENTS IN A TWO-VIEW DIFFUSION CHAMBER, PART III.
San 64 - Un Programma Per La Ricostruzione Spaziale Di Eventi In Camera A Diffusione Con Due Viste
by P. Salvadori. 14 Mar 66, 143p ISS-66/13
In Italian

Descriptors: Block, *Chamber, Computer, *Computer program, Diagram, *Diffusion, Figure, Formula, *Ibm 7040 computer, Program, Reconstruction, Spatial, Subroutine, Two, View.

For abstract, see S 04 20.

N66-35137 **Field 9B**
CFSTI Prices HC$2.00 MF$0.50
Deutsche Forschungsanstalt Fur Luft- Und Raumfahrt, Brunswick (West Germany).
REPORT ON THE COMPUTATION CENTER OF THE DEUTSCHE FORSCHUNGSANSTALT FUER LUFT- UND RAUMFAHRT FOR THE YEAR 1965.
Bericht Ueber Das Rechenzentrum Der Deutschen Forschungsanstalt Fuer Luft- Und Raumfahrt Fuer Das Jahr 1965
by R. Ludwig. Mar 66, 50p DLR-MITT.-66-02
In German, English Summary

Descriptors: Aerospace, Analog, Card, Center, *Computation, Computer, Digital, Facility, *Germany, Institute, Magnetic, Modification, Operation, Punch, Research, *Research facility, Study, System, Tape.

For abstract, see S 04 20.

N66-35174 **Field 9B**
CFSTI Prices HC$3.00 MF$0.50
General Dynamics/convair, San Diego, Calif.
A METHOD FOR EVALUATION OF STABILITY MATRIX ELEMENTS.
14 Jul 65, 51p NASA-CR-77430, GD/C-DDF-65-004
Contract NAS8-11479

Descriptors: Analysis, Computer, *Computer program, Data, Digital, *Digital computer, Dynamic, *Dynamic stability, Evaluation, Flow, Format, Input, Logic, Matrix, *Matrix analysis, Program, Stability, System.

For abstract, see S 04 20.

N66-35206 **Field 9B**
CFSTI Prices HC$2.50 MF$0.75
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
A DIGITAL HIGHER ORDER INTERPOLATION PATH CONTROLLER.
by W. G. Batte. Sep 66, 89p NASA-TN-D-3577

Descriptors: Automatic, Control, *Control system, Controller, Digital, *Digital technique, Higher order, *Interpolation, Path, Plotter, System, Technique, X-y plotter.

For abstract, see S 04 20.

N66-35237 **Field 9B**
CFSTI Prices HC$3.00 MF$0.75
California Univ., Berkeley.
AN APPROACH TO THE DESIGN OF A UNIVERSITY COMPUTER CENTER IN THE BEGINNING OF THE 1970_S.
by J. Y. Birrien. Jun 66, 92p NASA-CR-77507
Grant NSG-243-62
Its Internal Working Paper No. 47

Descriptors: Computer, Data, *Data processing, Design, Processing, Program, Research, Sharing, Simulation, Time, *Time sharing, University, *University program.

For abstract, see S 04 20.

PB-170 662 **Field 9B**
CFSTI Prices: HC$1.10 MF$0.50
Pennsylvania Univ., PhiladelphiaComputer Center.
A PERSPECTIVE VIEW OF MECHANICAL DIGITAL LANGUAGES.
by Saul Gorn. Jun 59, 7p
NSF Scientific Documentation Project. Presented at the International Conference on Information Processing, 13-22 Jun 59, Paris, (France).

Descriptors: (*Programming languages, Reviews), Digital computers, Programming (Computers), Standardization.

The progress of programming language development from 1951 to 1959 is reviewed. Prospects for a universal programming language are briefly considered.

PB-170 686 **Field 9B, 5C**
CFSTI Prices: HC$1.10 MF$0.50
Advanced Information Systems, Los Angeles, Calif.
PREDICTING CLERICAL ERROR.
by Gary Carlson. 1963, 3p
Datamation Magazine v9 n2 p34-6 2 Feb 1963
NSF Scientific Documentation Project.

Descriptors: (*Errors, Banking), (*Banking, Errors), Statistical analysis, Automation, Humans, Simulation, Machines, Mathematical prediction.

PB-170 820 **Field 9B**
CFSTI Prices: HC$1.60 MF$0.50
Case Inst. of Tech., Cleveland, Ohio.
COMPUTER PROGRAMS FOR THE GENERATION OF NEW CONCEPTS FROM OLD ONES.
by R. B. Banerji. 1966, 12p
Presented at the Karlsruhe Conference of the Deutsche Arbeitsgemeinschaft Kybernetik, Karlsruhe, Germany, April 1963. NSF Scientific Documentation Project.

Descriptors: (*Programming (Computers), *Artificial intelligence), Character recognition, Computer logic.

PB-172 474 **Field 9B**
CFSTI Prices: HC$2.60 MF$0.50
Kjeller Research Establishment (Norway). Institutt for Atomenergi.
A 100 CHANNEL SCANNER USING FIELD EFFECT TRANSISTORS AS ANALOG GATES.
by I. Orbeck. Mar 66, 21p KR-104

Descriptors: (*Scanning, Data processing systems), Digital systems, Transistors, Analog systems, Computer logic, Gates (Circuits).

Identifiers: Field-effect transistors.

The scanner was developed for use with digital data acquisition systems, and with some modifications it can be used as a fast multiplexer feeding information to a digital computer. Field effect transistors (FET) are used as switching elements offering advantages in speed, noise and reliability. Results show that thermocouples can be connected directly to the scanner, thus avoiding individual preamplifiers. The scanner has 100 channels, single or differential. The address is shown on nixie display tubes and BCD output is available for printing or punching. The scanner can be operated manually or automatically. Remote operation is possible. (Author)

AD-638 750 See Field 8E

AD-638 798 See Field 12A

AD-638 816 See Field 9A

AD-638 853 See Field 5J

AD-638 892 See Field 5I

AD-639 048 See Field 20H

AD-639 049 See Field 5H

AD-639 052 See Field 12A

AD-639 253 See Field 20N

AD-639 274 See Field 7D

AD-639 323 See Field 5G

AD-639 435 See Field 8K

AD-639 437 See Field 5A

AD-639 563 See Field 5J

AD-639 570 See Field 5A

N66-24905 See Field 5B

PB-170 590 See Field 5C

PB-170 591 See Field 5C

PB-170 705 See Field 6D

PB-170 812 See Field 5B

PB-170 986 See Field 14B

PB-173 173 See Field 13B

9C. ELECTRIC AND ELECTRONIC ENGINEERING

AD-638 758 **Field 9C, 10B, 17B**
CFSTI Prices: HC$2.00 MF$0.50
Air Force Communications Service, Scott AFB, Ill. Operations Research Analysis Office.
CONCEPT FOR FLEXIBLE, MOBILE, AND TRANSPORTABLE COMMUNICATIONS AND ELECTRONIC EQUIPMENT.
Operations research rept.
by R. L. Feik. May 66, 48p AFCS-2-ORR-66

Descriptors: (*Power equipment, Mobile), (*Electronic equipment, Power supplies), (*Communication equipment, Power supplies), Electric power production, Generators, Mobility, Military requirements.

The study examined the prime power problem from the aspect of what could be done to the communications or electronic equipment itself to minimize the outage time resulting from a power fluctuation or failure. The first phase of this study was directed toward mobile and transportable equipment.

AD-638 817 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Illinois Univ., Urbana. Coordinated Science Lab.

A NOTE ON FREQUENCY ENTRAINMENT.
by Nelson Wax. Sep 66, 22p R-318
Contract DA-28-043-AMC-00073 (E)
Proj. DA-20014501B31F

Descriptors: (*Oscillators, *Synchronization (Electronics)), Electrical engineering.

Identifiers: Frequency entrainment.

The synchronization of a finite set of weakly coupled oscillators to a small external signal is studied, using a method proposed by Struble. Difficulties with the problem of small divisors are avoided. Conditions for the existence of stationary oscillations are given, and the stability of these oscillations are investigated. The results are applied to two problems. (Author)

AD-639 091 **Field 9C, 9A**
CFSTI Prices: HC$3.00 MF$0.75
Naval Ammunition Depot, Crane, Ind.
MICRO-NOTES. INFORMATION ON MICROELECTRONICS FOR NAVY EQUIPMENTS.
30 Sep 66, 86p Micro-Notes no. MN-17, Rept. no. 66-660
See also AD-635 626.

Descriptors: (*Naval equipment, *Microminiaturization (Electronics)), Epitaxial growth, Power supplies, Test methods.

Contents: Epitaxial studies (Part VII); Microelectronic power supply program; Evaluation of Westinghouse family DTL 200; Evaluation of ITT DTL MIC 900 series; Evaluation of radiation family DTL 200; Evaluation of sprague modules UC 6007C, UC 6008C, UC 6009C.

N66-24111 **Field 9C**
CFSTI Prices HC$2.00 MF$0.50
Southern Methodist Univ., Dallas, Tex.
SYNTHESIS OF ACTIVE DISTRIBUTED RC NETWORKS.
by J. S. Fu, and Y. Fu. Mar 66, 31p NASA-CR-71800
Contract NGR-44-007-006

Descriptors: Capacitor, Circuit, Coefficient, Conductor, Configuration, Dielectric, Function, *Low pass filter, Network, Open, Port, Rational, *Rc network, Real, Transfer, *Transfer function, Two.

For abstract, see S 04 13.

N66-24398 **Field 9C**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE ELECTRONICS BRAIN ON BOARD THE X-RAY TELESCOPE SPECTROMETER EXPERIMENT.
by H. Doong, and M. Noordzy. Feb 66, 25p NASA-TM-X-55461, X-611-66-70

Descriptors: Balloon, Brain, Circuit, *Computer, Detector, Electronics, Experiment, Flight, High altitude, Onboard, Operation, *Spectrometer, System, Telescope, X-ray, *X-ray telescope.

For abstract, see S 04 13.

N66-24591 **Field 9C**
CFSTI Prices HC$2.00 MF$0.50
Purdue Univ., Lafayette, Ind.
INVESTIGATION OF OPTIMIZATION OF ATTITUDE CONTROL SYSTEMS QUARTERLY PROGRESS REPORT, 1 JAN. - 31 MAR. 1966.
by J. Y. Luh. 1966, 43p NASA-CR-74627
Contracts NAS7-100, JPL-950670
Prepared For Jpl

Descriptors: Antenna, Attitude, *Attitude control, Bound, Control, Coordinate, Harmonic, Optimal, *Optimal control, Optimization, Oscillator, Phase, Point, Process, Space vehicle, *Space vehicle control, Stochastic, *Stochastic process, System.

For abstract, see S 04 13.

N66-24895 **Field 9C**
CFSTI Prices HC$2.00 MF$0.50
Technisch Documentatie En Informatie Centrum Voor De Krijgsmacht, The Hague (Netherlands).
SURVEY OF LITERATURE ON ELECTROTECHNOLOGY.
Literatuuroverzicht Electrotechniek
7 Mar 66, 40p
In English, German, And Dutch Its Vol. 15, No. E-482

Descriptors: *Abstract, Antenna, *Bibliography, Circuit, *Computer, Electromagnetic, *Electronics, Equipment, *Integrated circuit, Integration, Logic, Miniaturization, Noise, Radar, *Radar equipment, Radiation, *Telecommunication, Tube, Waveguide.

For abstract, see S 04 13.

N66-24934 **Field 9C**
CFSTI Prices HC$4.00 MF$1.00
Honeywell, Inc., St. Paul, Minn.
BOUNDED PHASE COORDINATE CONTROL FINAL REPORT, 15 JUN. 1964 - 14 JUN. 1965.
by J. Y. Luh. May 66, 124p NASA-CR-470
Contract NASW-986

Descriptors: Analog, Bound, Computer, Control, *Control system, Coordinate, Method, Optimal, *Optimal control, Phase, *Pontryagin principle, Program, System, Time, Trajectory.

For abstract, see S 04 13.

N66-24945 **Field 9C**
CFSTI Prices HC$4.00 MF$0.75
Westinghouse Electric Corp., Baltimore, Md.
A REDUNDANT SPACECRAFT SEQUENCER BREADBOARD PHASE I REPORT, DEC. 22, 1965 - MAR. 30, 1966.
1966, 115p NASA-CR-74675
Contracts NAS7-100, JPL-951345
Prepared For Jpl

Descriptors: Breadboard, Circuit, *Computer, Control, *Control device, Device, Discrete, *Integrated circuit, Integration, Logic, Mariner c spacecraft, *Mariner program, Mariner spacecraft, Multiple, Redundancy, *Redundant system, Sequence, Spacecraft, System.

For abstract, see S 04 13.

N66-24971 **Field 9C**
CFSTI Prices HC$1.00 MF$0.50
Westinghouse Electric Corp., Baltimore, Md.
RESEARCH ON FAILURE FREE SYSTEMS QUARTERLY REPORT NO. 7, DEC. 23, 1965 - MAR. 23, 1966.
1966, 11p NASA-CR-74686, WGD-38521
Contract NASW-572

Descriptors: Component, *Component reliability, Computer, Failure, Free, Method, Procedure, Redundancy, *Redundant system, Reliability, System, *System failure, Test.

For abstract, see S 04 13.

N66-25162 **Field 9C**
CFSTI Prices HC$3.00 MF$0.75
Tennessee Univ., Knoxville.
APPLICATIONS OF RATE DIAGRAMS TO THE ANALYSIS AND DESIGN OF A CLASS OF ON-OFF CONTROL SYSTEMS.
by R. C. Lake. May 66, 68p NASA-CR-484
Grant NSG-351

Descriptors: Analysis, Control, *Control system, Diagram, Equation, Error, Filter, On-off, Rate, Signal, System, *Systems analysis.

For abstract, see S 04 13.

N66-25531 **Field 9C**
CFSTI Prices HC$2.00 MF$0.50
Massachusetts Inst. Of Tech., Cambridge.
THE DISCRETE MINIMUM PRINCIPLE WITH APPLICATION TO THE LINEAR REGULATOR PROBLEM.
by M. Athans, and D. L. Kleinman. Feb 66, 30p NASA-CR-74852, ESL-R-260
Grant NSG-496

Descriptors: Control, Discrete, *Discrete function, Dynamic, Feedback, *Feedback control system, Function, Linear, Minimum, Optimal, *Optimization, Principle, Quadratic, System.

For abstract, see S 04 14.

N66-25562 **Field 9C**
CFSTI Prices HC$3.00 MF$0.75
Stanford Univ., Calif.
THE OPTIMIZATION OF A RELAY CONTROLLED SYSTEM SUBJECTED TO RANDOM DISTURBANCES.
by G. A. Hyver. May 66, 98p NASA-CR-491
Grant NSG-133-61

Descriptors: Control, *Control system, *Gaussian noise, Linear, Maximum, Noise, *Optimization, Principle, Random, *Random noise, *Relay, Stochastic, System.

For abstract, see S 04 14.

N66-25623 **Field 9C**
CFSTI Prices HC$3.60 MF$0.50
Illinois Univ., Urbana. International Training Centre For Aerial Survey, Delft (Netherlands).
AN ALTERNATIVE APPROACH TO THE SOLUTION OF A CLASS OF WIENER- HOPE AND RELATED PROBLEMS TECHNICAL REPORT NO. 8.
by C. P. Bates, and R. Mittra. Feb 66, 31p NASA-CR-75265, ALR-65-21
Grant NSG-395, Contract AF 19/628/-3819
Presented At The Ursi Em Theory Symp., Delft, Netherlands Its Rept.-65-21

Descriptors: Boundary, Diffraction, Equation, Field, *Field theory, Integral, Problem, Propagation, Radiation, Solution, Theory, Value, Wave, *Waveguide, *Wiener-hopf equation.

For abstract, see S 04 14.

N66-26286 **Field 9C**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
DERIVATION OF THE MATHEMATICAL TRANSFER FUNCTION OF AN ELECTRODYNAMIC VIBRATION EXCITER.
by C. P. Chapman. 15 May 66, 19p NASA-CR-75151, JPL-TR-32-934
Contract NAS7-100

Descriptors: Acceleration, Amplifier, *Electrodynamics, *Excitation, Function, Input, *Mathematical model, Mathematics, Model,

Output, Phase, Power, Shift, Signal, System, Table, Transfer, *Transfer function, *Vibration.

For abstract, see S 04 14.

N66-26554 **Field 9C**
CFSTI Prices HC$4.00 MF$1.00
National Aeronautics And Space Administration. Manned Spacecraft Center, Houston, Tex.
A COMPARATIVE ANALYSIS OF CASCADE AND FEEDBACK COMPENSATION.
by D. K. Norling. May 66, 131p NASA-TM-X-58000

Descriptors: *Cascade, Compensation, Control, Dynamics, Electric, *Electric control, Feedback, *Feedback control system, Logarithm, Modulus, Pole, Root, State, Steady, System.

For abstract, see S 04 14.

N66-26853 **Field 9C**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TAPE GENERATION PROGRAM (USERS MANUAL).
by R. C. Lee. May 66, 69p NASA-TM-X-55489, X-564-66-220

Descriptors: Card, Computer, Data, *Data processing, Input, Perturbation, Processing, Program, Punch, *Punched tape, Satellite, Tape, *Telemetry, Transmission, *Univac 1107 computer.

For abstract, see S 04 14.

N66-26879 **Field 9C**
CFSTI Prices HC$3.00 MF$0.50
New York Univ., N. Y.
THE AVERAGE NUMBER OF ZERO CROSSINGS PER SECOND OF A SINUSOIDAL SIGNAL PLUS NOISE TECHNICAL MEMORANDUM NO. 44.
by G. Weiss. Jan 65, 51p NASA-CR-75279
Contract NAS5-9809

Descriptors: Average, Crossing, Effect, Error, Fading, *Frequency, Measurement, Method, Noise, Random, Signal, *Signal noise, *Sinusoid, Source, *Voltage, Zero.

For abstract, see S 04 14.

N66-34671 **Field 9C**
CFSTI Prices HC$3.00 MF$0.75
Harvard Univ., Cambridge, Mass.
JOINT SERVICES ELECTRONICS PROGRAM SEMIANNUAL PROGRESS REPORT NO. 71, 1 JUL. - 1 DEC. 1965.
May 66, 84p NASA-CR-77224, AD-634148
Contracts NONR-1866/16/, NONR-1866/07/
Sponsored In Part By Nasa

Descriptors: *Abstract, Automatic, *Automatic control, *Communication, Control, Electromagnetic, *Electromagnetic radiation, Electron, Ferrimagnetic, Ferromagnetism, Frequency, *Microwave, Physics, Project, Propagation, Radiation, Research, *Research project, Solid, State, Very low, *Very low frequency.

For abstract, see S 04 20.

N66-34679 **Field 9C**
CFSTI Prices HC$6.00 MF$1.50
Texas Univ., Austin.
OPTIMAL STOCHASTIC CONTROL THEORY APPLIED TO INTERPLANETARY GUIDANCE.
by J. F. Jordan Jr. Aug 66, 246p NASA-CR-77212, EMRL-TR-1004
Grant NSG-551

Descriptors: Calculus, Control, *Control stability, Determinant, Earth, Guidance, *Guidance and control, Interplanetary, *Interplanetary trajectory, Mars, Noise, *Noise reduction, Optimal, Process, Reducer, Space, Spacecraft, Stability, Stochastic, *Stochastic process, Trajectory, Transfer, Variation.

For abstract, see S 04 20.

N66-34792 **Field 9C**
CFSTI Prices HC$4.00 MF$1.00
Mississippi State Univ., State College.
DEVELOPMENT OF A VALID MATHEMATICAL FORMULA OR GROUP OF FORMULAS TO ESTABLISH WITHIN AN ACCURACY OF 5 PERCENT THE INDUCTANCE AUDIO RANGE RESULTING IN BERYLLIUM COIL ASSEMBLIES FINAL REPORT.
by B. J. Ball, C. G. Catledge, L. J. Hill, and D. D. Wier. 1961. 129p NASA-CR-77415
Contract NAS8-20229

Descriptors: Audio, Audiofrequency, Beryllium, Capacitance, *Coil, *Cryogenics, Electric, Field, Formula, Hammer, *Inductance, *Mathematical model, Mathematics, Model, Range, Resistance, Sealing.

For abstract, see S 04 20.

N66-34793 **Field 9C**
CFSTI Prices HC$4.00 MF$0.75
Lockheed Missiles And Space Co., Huntsville, Ala.
DESIGN GUIDELINES FOR CIRCUITRY IN A NUCLEAR REACTOR-PROPELLED SPACECRAFT FINAL REPORT.
by J. L. Westrom. 1 Jul 66, 114p NASA-CR-77419, LMSC/HREC-A782893
Contract NAS8-11755

Descriptors: *Circuit, Converter, Damage, Dc, Direct current (dc), Integration, Nuclear, Power, *Power supply, Radiation, *Radiation resistance, *Reactor, Regulator, Resistance, Semiconductor, *Spacecraft, Summator, Supply, Switching, Transistor.

For abstract, see S 04 20.

N66-34826 **Field 9C**
CFSTI Prices HC$7.00 MF$2.50
National Aeronautics And Space Administration, Washington, D. C.
AUTOMATIC REGULATION AND CONTROL SELECTED PARTS.
by YA. Z.Tsypkin. Jul 66, 465p NASA-TT-F-373
Transl. Into English From The Book "avtomaticheskoye Regulirovaniye I Upravleniye" Moscow, Izd. An Sssr, 1962 P 1-188, 242-296, 426-473 Presented At The 7th Conf. Of Young Scientists Of The Inst. Of Automation And Remote Control, Mar. 1960

Descriptors: Automatic, *Automatic control, Autopilot, Boolean algebra, Circuit, Computer, *Conference, Control, Data, Digital, *Digital computer, Equation, Feedback, Industry, Logic, *Logic circuit, Machine, *Machine tool, Optimal, Processing, Radio, *Relay, Remote, Switching, Tool, Transmission, U.s.s.r.

For abstract, see S 04 20.

N66-35014 **Field 9C**
CFSTI Prices HC$7.00 MF$1.75
California Univ., Berkeley.
SEMIANNUAL PROGRESS REPORT NO. 1, 16 NOVEMBER 1964 - 30 JUNE 1965.
1965, 304p NASA-CR-77391
Grant NSG-354, Contract AF 33/615/-2306

Descriptors: *Bioinstrumentation, Electron, *Electron interaction, Electronics, Interaction, Optical, *Plasma, Project, Propagation, Quantum, Radiation, Research, *Research project, Solid, State, Stream.

For abstract, see S 04 20.

N66-35049 **Field 9C**
CFSTI Prices HC$5.00 MF$1.00
Rensselaer Polytechnic Inst., Troy, N. Y.
IDENTIFICATION AND CONTROL OF A FLEXIBLE LAUNCH VEHICLE.
by K. W. Jenkins, and R. Roy. Aug 66, 159p NASA-CR-551
Contract NGR-33-018-14

Descriptors: Adaptive, Body, Computer, Control, *Control system, Digital, Discrete, Disturbance, Estimation, Flexible, *Flexible body, Identification, *Launch vehicle, Least squares method, Linear, Loop, Parameter, Pitch, *Pitch control, Plant, State, Stochastic, System, Time, Variation, Wind.

For abstract, see S 04 20.

N66-35232 **Field 9C**
CFSTI Prices HC$3.00 MF$0.75
Lockheed Missiles And Space Co., Huntsville, Ala.
ELECTROFLUID CONVERTER FINAL REPORT, 25 JUN. 1965 - 25 MAR. 1966.
25 Mar 66, 62p NASA-CR-77547, LMSC/HREC-A782436
Contract NAS8-11924

Descriptors: Amplifier, *Converter, Electric, Energy, *Energy conversion, Filter, Fluid, *Fluid amplifier, Interface, *Piezoelectricity, Pulse, Signal, Stimulus, Valve.

For abstract, see S 04 20.

PB-170 408 **Field 9C**
CFSTI Prices: HC$3.60 MF$0.50
Stanford Univ., Calif. Stanford Electronics Labs.
IMPEDANCE SYNTHESIS VIA STATE-SPACE TECHNIQUES.
by B. D. O. Anderson, and R. W. Newcomb. Apr 66, 35p Technical rept. TR-6558-5, SU-SEL-66-024
Grant NSF-GK-237

Descriptors: (*Electrical impedance, Synthesis), Control systems, Theory, Matrix algebra, Circuits, Networks.

Identifiers: Control theory.

Using the control theory concept of minimal state-space realizations an algebraic synthesis of positive-real impedance matrices is obtained through an appropriate basis change in the state-space. (Author)

PB-170 750 **Field 9C**
CFSTI Prices: HC$1.60 MF$0.50
Boeing Co., Seattle, Wash. Aero-Space Div.
VARIABLE RF ATTENUATOR AV-75 (JERROLD ELECTRONICS CORP.).
Technical manual instrument calibration procedure, AN-12.
1 Mar 66, 12p
Contract N123 (62861)35056A
NAVWEPS-17-20AN-12

Descriptors: (*Attenuators, Calibration), (*Calibration, Instruction manuals), Test equipment (Electronics), Test methods.

The procedure describes the calibration of the Jerrold Electronics Corp. AV-75 Variable RF Attenuator.

PB-170 751 **Field 9C**
CFSTI Prices: HC$1.60 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
INDICATING INSTRUMENTS: ALTERNATING CURRENT.
Technical manual instrument calibration procedure, AI-09.
1 Mar 66, 11p NAVWEPS-17-20AI-09

Descriptors: (*Ammeters, Calibration), (*Calibration, Instruction manuals), Alternating current, Test equipment (Electronics), Test methods.

The procedure describes the calibration of alternating-current meters.

PB-170 752 **Field 9C**
CFSTI Prices: HC$1.10 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
TIME MARK GENERATOR 166B OR HO2-166B (HEWLETT-PACKARD).
Technical manual instrument calibration procedure, AG-71.
1 Jan 66, 7p NAVWEPS-17-20AG-71

Descriptors: (*Signal generators, Calibration), (*Calibration, Instruction manuals), Time, Test equipment (Electronics), Test methods.

The procedure describes the calibration of the Hewlett-Packard Model 166B and HO2-166B Time Mark Generator.

PB-170 810 **Field 9C, 14B**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
OSCILLOSCOPE, OS-121/USM-140, OS-121A/USM-140A, OS-121B/USM-140B, OS-121D/USM-140D, OS-122/USM-141, OS-122A/USM-141A, 170A, HO2-170A, 170AR, HO2-170AR, 170B, 170BR (HEWLETT-PACKARD) 1807, 1807A, 1807R (HICKOK).
Technical manual instrument calibration procedure, VW-03.
1 Jul 66, 31p NAVWEPS-17-20VW-03

Descriptors: (*Oscilloscopes, Calibration), (*Calibration, Instruction manuals), Test equipment (Electronics), Test methods.

The procedure describes the calibration of the OS-121/USM-140, OS-121A/USM-140A, OS-121B/USM-140B, OS-121D/USM-140D, OS-122/USM-141, and OS-122A/USM-141A; the Hewlett-Packard 170A, HO2-170A, 170AR, HO2-170AR, 170B, and 170BR; and the Hickok 1807, 1807A, and 1807R oscilloscopes.

PB-170 811 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
AUDIO SIGNAL GENERATOR TS-421/U TS-421A/U OR HEWLETT-PACKARD 205 AG.
Technical manual instrument calibration procedure, VG-09.
15 Jul 66, 20p NAVWEPS-17-20VG-09

Descriptors: (*Signal generators, Calibration), Audiofrequency.

PB-170 852 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
PHASE ANGLE VOLTMETERS VM-204 SERIES (NORTH ALANTIC INDUSTRIES).
Technical manual instrument calibration procedure, AZ-23.
1 May 66, 21p NAVWEPS-17-20AZ-23

Descriptors: (*Voltmeters, Calibration), (*Calibration, Instruction manuals), Test equipment (Electronics), Test methods.

The procedure describes the calibration of the North Atlantic Industries model VM-204 series phase angle voltmeters.

PB-170 853 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Burroughs Corp., Radnor, Pa.
RANGE CALIBRATOR TS-358/UP.
Technical manual instrument calibration procedure GG-18.
1 May 66, 14p
Contract N123 (62861)35057A
NAVWEPS-17-20GG-18

Descriptors: (*Range finding, Calibration), (*Calibration, Instruction manuals), Test equipment (Electronics), Test methods.

The procedure contains the information necessary for calibrating the TS-358/UP Range Calibrator, used for calibrating, testing, or adjusting electronic range-measuring equipment.

PB-170 854 **Field 9C**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
OSCILLOSCOPE AN/USM-32 (OS-34/USM-32).
Technical instrument calibration procedure, VW-10.
1 Jul 66, 19p NAVWEPS-17-20VW-10

Descriptors: (*Oscilloscopes, Calibration), (*Calibration, Instruction manuals), Test equipment (Electronics), Test methods.

The procedure describes the calibration of the OS-34/USM-32 oscilloscope.

PB-170 882 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
RECEIVER TEST SET TS-1751/SRM-2.
Handbook instrument calibration procedures.
11 Mar 66, 10p NAVWEPS 17-20BCK-2
This Publication Supersedes NAVWEPS 17-20BCK-2 dated 1 August 1965.

Descriptors: (*Test sets, Calibration), (*Radio receivers, Test sets), (*Calibration, Instruction manuals), Test methods, Test equipment (Electronics).

PB-170 883 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
RELAY TEST SET TS-1752/SRM-2.
Handbook instrument calibration procedures.
Mar 66, 8p NAVWEPS 17-20BCK-3
This publication supersedes NAVWEPS 17-20BCK-3 dated 1 August 1965.

Descriptors: (*Test sets, Calibration), (*Relays, Test sets), (*Calibration, Instruction manuals), Test methods, Electric switches, Multimeters.

The procedure describes the calibration of Relay Test Set TS-1752/SRM-2, which tests Radio Frequency Transmission Line Switch SA-631/SRW-4, and each type of relay used with Target Control System AN/SRW-4.

PB-170 884 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
AUDIO FREQUENCY CODERS KY-430/SRM AND KY-431/SRM.
Handbook instrument calibration procedures.
11 Mar 66, 16p NAVWEPS 17-20BCK-6
This publication supersedes NAVWEPS 17-20BCK-6 dated 1 August 1965.

Descriptors: (*Modulators, Calibration), (*Calibration, Instruction manuals), Test equipment (Electronics), Test methods, Audiofrequency, Coding.

The procedures describe the calibration of Audio Frequency Coder KY-430/SRM and KY-431/SRM.

PB-170 885 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Naval Air Systems Command, Washington, D. C.
SIGNAL GENERATOR HEWLETT-PACKARD 608C OR HO1-608C/CR.
Technical manual instrument calibration procedure VG-15.
15 Jul 66, 22p NAVAIR 17-20VG-15

Descriptors: (*Signal generators, Calibration), (*Calibration, Instruction manuals), Test methods, Test equipment (Electronics).

The procedure describes the calibration of the Hewlett-Packard 608C or HO1-608C/CR signal generator.

PB-170 886 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Naval Air Systems Command, Washington, D. C.
SIGNAL GENERATOR HEWLETT-PACKARD 608A OR 608B.
Technical manual instrument calibration procedure VG-19.
15 Jun 66, 22p NAVAIR 17-20VG-19

Descriptors: (*Signal generators, Calibration), (*Calibration, Instruction manuals), Test equipment (Electronics), Test methods.

PB-170 887 **Field 9C, 14B**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
OSCILLOSCOPE OS-82/USM-105, OS-82A/USM-105A, OS-120/USM-139, OS-129/ASM-35 HEWLETT-PACKARD 160A, 160B, 160BR HICKOK 1804, 1804A or 1804R.
Technical manual instrument calibration procedure VW-02.
15 Jul 66, 32p NAVWEPS 17-20VW-02

Descriptors: (*Oscilloscopes, Calibration), (*Calibration, Instruction manuals), Test methods, Test equipment (Electronics).

The procedure describes the calibration of the OS-82/USM-105, OS-82A/USM-105A, OS-120, USM-139, and OS-129/ASM-35; the Hewlett-Packard 160A, 160B, and 160BR; and the Hickok 1804, 1804A and 1804R oscilloscopes.

PB-170 939 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
TRANSMITTER TEST SET TS-1753/SRM-2.
Handbook instrument Calibration procedures, BCK-4.
11 Mar 66, 9p NAVWEPS-17-20BCK-4
PB-168 586 superseded.

Descriptors: (*Test sets, Calibration), (*Radio transmitters, Test sets), (*Calibration, Instruction manuals), Test methods.

The procedure describes the calibration of Transmitter Test Set TS-1753/SRM-2. The Test Set provides the necessary voltages, dummy loads, controls, and indicators to individually test each transmitter subassembly.

PB-170 940 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
AUDIO FREQUENCY DECODERS KY-432/SRM AND KY-433/SRM.
Handbook instrument calibration procedures, BCK-7.
11 Mar 66, 19p NAVWEPS-17-20BCK-7
PB-168 581 superseded.

Descriptors: (*Demodulators, Calibration), (*Calibration, Instruction manuals), Decoding, Audiofrequency, Test equipment (Electronics), Test methods.

The procedures describe the calibration of Audio Frequency Decoder KY - 432/SRM - 3 and KY-433/SRM.

PB-170 941 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
SUPERVISORY PANEL MODULE TEST INSTRUMENT. MODEL NO. TEH198-1. STOCK NO. RX4920-075-1997-S110 (LELAND).
Technical manual calibration procedures, VET-6.
15 Mar 66, 19p NAVWEPS-17-20VET-6

Descriptors: (*Test equipment (Electronics), Calibration), (*Panel boards (Electricity), Test equipment (Electronics)), (*Calibration, Instruction manuals), Test methods.

The manual covers the calibration of the Supervisory Panel Module Test Instrument, Model TEH198-1.

PB-172 422 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
CAPACITANCE-INDUCTANCE-RESISTANCE AN/URM-90 ZM-30/U.
Technical manual instrument calibration procedure Test Set, AZ-22.
1 Jun 66, 16p
NAVWEPS-17-20AZ-22
This publication supersedes the interim edition released by the Metrology Engineering Center on 15 August 1964.

Descriptors: (*Test sets, Calibration), (*Calibration, Instruction manuals), Test methods, Inductance, Capacitance, Resistance (Electrical).

PB-172 456 **Field 9C**
CFSTI Prices: HC$11.60 MF$0.75
Cooley Electronics Lab., Univ. of Michigan, Ann Arbor.
THE SYNTHESIS OF NONUNIFORM TRANSMISSION LINES.
Technical rept.
by P. G. Cath. Jan 61, 120p TR-116
Contract DA-36-039-sc-78283
Proj. DA-3A99-06-001-01
AD-250 726

Descriptors: (*Transmission lines, Synthesis), (*Impedance matching, Transmission lines), Transformers, Approximation (Mathematics), Distribution functions, Integral transforms.

A general synthesis procedure was developed by which matching sections can be synthesized. A matching section is a section of lossless nonuniform transmission line of finite length that provides a match between a generator with complex internal impedance and a complex load impedance, such that maximum power transfer is achieved over a specified range of frequencies. The synthesis procedure is based upon approximate solutions to the equations describing nonuniform transmission lines that have appeared in the literature. Using these approximate solutions, the matching problem is reduced to the problem of finding a real function, the reflection-distribution function, whose complex Fourier transform approximates a complex function, determined by the generator and load impedances. The reflection-distribution function is found by expansion into a trigonometric series and subsequently determining the coefficients in this expansion. The approximation process makes use of the theory of discrete Chebyshev approximation.

PB-172 961 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
DC VOLTAGE STANDARD AND NULLMETER KIN TEL 302.
Technical manual instrument calibration procedure AH-16.
1 Jun 66, 16p
NAVWEPS-17-20AH-16
This publication supersedes interim edition released by the Metrology Engineering Center on 1 Aug 64.

Descriptors: (*Measuring devices (Electrical + electronic), Calibration), (*Calibration, Instruction manuals), Voltage, Standards, Test equipment (Electronics), Test methods.

The procedure describes the calibration of the Kin Tel 302 DC voltage standard and nullmeter.

PB-172 962 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
ALTERNATING VOLTAGE INDICATING INSTRUMENTS.
Technical manual instrument calibration procedure AE-33.
1 Mar 66, 9p
NAVWEPS-17-20AE-33
This publication supersedes NAVWEPS 17-25BE-03 dated 19 September 1958 and NAVWEPS 17-25BE-04 dated 22 September 1958.

Descriptors: (*Voltmeters, Calibration), (*Calibration, Instruction manuals), Alternating current, Test methods, Test equipment (Electronics).

The procedure describes the calibration of alternating-voltage meters.

PB-172 963 **Field 9C, 14B**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
RADAR TEST SET TS-757/UPM-32.
Technical manual instrument calibration procedure GQ-14.
1 Jun 66, 44p
NAVWEPS-17-20GQ-14

Descriptors: (*Test sets, Radar equipment), (*Calibration, Test sets), Test methods, Test equipment (Electronics), Instruction manuals.

PB-172 964 **Field 9C, 14B**
CFSTI Prices: HC$2.00 MF$0.50
SSCO Standards Lab., Inc., Southfield, Mich.
SIGNAL GENERATOR AND MODULATOR 8614A, 8714A (HEWLETT-PACKARD).
Technical manual instrument calibration procedure GG-20.
1 Jun 66, 29p
Contract N123 (62861)35059A
NAVWEPS-17-20GG-20

Descriptors: (*Signal generators, Calibration), (*Modulators, Calibration), (*Calibration, Instruction manuals), Test methods, Test equipment (Electronics).

PB-173 120 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
PHASE ANGLE VOLTMETER NORTH ATLANTIC INDUSTRIES VM-202BR OR VM-202BRT.
Technical manual instrument calibration procedure, AZ-12.
15 Jun 66, 19p
NAVWEPS-17-20AZ-12
This publication supersedes NAVWEPS 17-20AZ-12 dated 15 February 1965 changed 1 March 1965.

Descriptors: (*Voltmeters, *Calibration), Instruction manuals, Test methods, Test equipment (Electronics).

PB-173 122 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
ECHO BOX TS-488/UP OR TS-488A/UP.
Technical manual instrument calibration procedure.
1 Jun 66, 11p
NAVWEPS-17-20NF-09
This publication supersedes the interim edition released by the Metrology Engineering Center on 1 August 1963.

Descriptors: (*Test equipment, *Radar equipment), (*Calibration, Test equipment), Radar equipment, Test methods, Test equipment (Electronics), Instruction manuals.

PB-173 123 **Field 9C, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
NOISE FIGURE METER AND VHF NOISE SOURCE H01-340B OR 340B AND 343A (HEWLETT-PACKARD).
Technical manual instrument calibration procedure, AG-86.
1 Jun 66, 14p
NAVWEPS-17-20AG-86
This publication supersedes NAVWEPS 17-20AG-86 dated 15 December 1964 changed 1 April 1966.

Descriptors: (*Noise analyzers, Calibration), (*Calibration, Instruction manuals), Test equipment (Electronics), Test methods, Noise generators.

The procedure describes the calibration of the Hewlett-Packard 340B or H01-340B Noise Figure Meter and the Hewlett-Packard 343A VHF Noise Source which herein referred to as the Test Instrument. The Test Instrument automatically measures and continuously displays the noise figure of the receiver or amplifier to which it is connected.

PB-170 968 **See Field 14B**

PB-173 075 **See Field 14B**

PB-173 076 **See Field 14B**

PB-173 086 **See Field 9E**

PB-173 112 **See Field 14B**

PB-173 222 **See Field 13B**

PB-173 223 **See Field 13B**

9D. INFORMATION THEORY

AD-638 878 **Field 9D**
CFSTI Prices: HC$5.00 MF$1.25
Foreign Technology Div., Wright-Patterson AFB, Ohio.
CODES IN ENGINEERING.
by Yu. G. Zarenin, and V. L. Inosov. 4 Apr 66, 267p FTD-TT-65-1558
TT-66-62228
Edited trans. of mono. Kody v Tekhnitsi, Kiev, 1964 251p.

Descriptors: (*Coding, Textbooks), Engineering, Errors, Corrections, Information theory, USSR.

Identifiers: Error-correcting codes, Binary coding, Binary-decimal code.

Contents: Basic concepts and notations; reliability of transmission of information and increasing the reliability of coding methods; comparison of different coding methods; coding and codes in communication engineering; coding and codes in remote control; coding and codes in computer engineering.

AD-639 558 **Field 9D**
CFSTI Prices: HC$3.60 MF$0.50
RAND Corp., Santa Monica, Calif.

A COMPARISON OF RANDOM AND PERIODIC DATA SAMPLING FOR THE DETECTION OF SIGNALS IN NOISE.
by David Middleton. 1 Feb 59, 31p P-1642
Published in the transactions of the International Symposium on Circuit and Information Theory.

Descriptors: (*Signal-to-noise ratio, *Information theory), Signals, Detection, Sampling, Statistical analysis.

Threshold coherent and incoherent detection of signals in normal noise is examined when random data sampling is employed at the receiver. The resulting optimum system and its threshold performance are compared with the corresponding cases where periodic sampling is used. Expressions for the system structure, the error probabilities, and the Bayes risk are obtained; for most of the specific examples examined it is found that periodic sampling gives better performance than random sampling. A discussion of the generality of these results is given in the concluding section. (Author)

AD-639 616 **Field 9D**
CFSTI Prices: HC$2.00 MF$0.50
Illinois Univ., Urbana. Coordinated Science Lab.
WEIGHT DISTRIBUTION OF BOSE-CHAUDHURI-HOCQUENGHEM CODES.
by Tadao Kasami. Aug 66, 36p Rept. no. R-317
Contracts DA-28-043-AMC-00073 (E), AF 19 (628)4379
Proj. DA-20014501B31F
Supported in part by grant from National Science Foundation, NSF-GK-690.

Descriptors: (*Coding, Theory), Distribution theory, Invariance, Permutations.

Identifiers: Bose-Chaudhuri-Hocquenghem codes.

N66-24973 **Field 9D**
CFSTI Prices HC$1.00 MF$0.50
Northeastern Univ., Boston, Mass.
UTILIZATION OF INFORMATION THEORY IN DIGITAL DATA GUIDANCE SYSTEMS QUARTERLY PROGRESS REPORT NO. 2, 1 DEC. 1965 - 28 FEB. 1966.
by S.-H. Chang. 23 Mar 66, 20p NASA-CR-74689
Contract NGR-22-011-013

Descriptors: Circuit, Code, Correction, Data, *Decoding, Digital, Dual, Error, Function, Guidance, Information, *Information theory, Logic, Product, Sampling, Theorem, Theory, Time.

For abstract, see S 04 13.

N66-24974 **Field 9D**
CFSTI Prices HC$1.00 MF$0.50
Northeastern Univ., Boston, Mass.
UTILIZATION OF INFORMATION THEORY IN DIGITAL DATA GUIDANCE SYSTEMS QUARTERLY PROGRESS REPORT NO. 1, 1 SEP. - 30 NOV. 1965.
by S.-H. Chang. 10 Dec 65, 19p NASA-CR-74690
Contract NGR-22-011-013

Descriptors: Bandwidth, Compression, Data, Digital, *Digital data, Guidance, *Guidance system, Information, *Information theory, Rate, System, Telemetry, Theory, Transmission.

For abstract, see S 04 13.

N66-24975 **Field 9D**
CFSTI Prices HC$1.00 MF$0.50
Northeastern Univ., Boston, Mass.
A NOTE ON NON-BINARY ORTHOGONAL CODES.
by S.-H. Chang. 1965, 11p NASA-CR-74691
Contracts NGR-22-011-013, AF 19/628/-3312

Descriptors: Algebra, Coding, *Coding system, Construction, Element, Function, Inspection, Integer, Length, Matrix, *Matrix algebra, Maximum, Orthogonal, *Orthogonal function, Recursion formula, Sequence, System.

For abstract, see S 04 13.

AD-639 254 **See Field 17B**

AD-639 300 **See Field 12A**

9E. SUBSYSTEMS

AD-483 765 **Field 9E**
CFSTI Prices: HC$3.00 MF$0.75
UNIVAC, Blue Bell, Pa.
INVESTIGATION OF LOGIC CIRCUIT COMPLEXES: RELIABILITY AND FAULT MASKING IN HOMOGENEOUS LOGICAL SYSTEMS.
Final rept., 16 Mar 64-15 Apr 66.
by Marion S. Dunning, and Bernard Kolman. 15 Apr 66, 82p
Contract AF 19 (628)-4051
Proj. AF-4641
Task 464101
AFCRL-66-286
See also AD-617 516.

Descriptors: (*Gates (Circuits), Reliability (Electronics)), Optimization, Topology, Diodes (Semiconductor), Embedding substances, Redundant components, Errors, Malfunctions, Probability, Failure (Electronics).

The current study continues the comparison of quadded and restored trees. Explicit equations were derived for computing the signal-state reliability which is defined as the probability of correct output for a given function and a given assignment of values to the variables averaged over all variable assignments and all functions. An investigation was made of a new logical structure composed uniformly of diodes. The structure is called a v sub q-module. The v sub q-module, like the micro sub q-module, is capable of executing all functions of q variables. Function selection is also made by applying constant signals to the 2 super scrip q boundary control lines and failure of any component results in the improper execution of at least one of the 2 superscrip 2q functions. The tree which executes all functions of n variables is built out of v sub q-modules and v sub r-modules, where $n = pq + r$ for some p, and is called the n-variable $(q+1)$-input AND-OR tree. An optimization study was made to find the q and r for a given n which result in the most reliable n-variable AND-OR tree. Three failure models of the diode were studied and for each a redundance scheme is introduced which renders any homogeneous logic structure composed of diodes arbitarily reliable. If the diode is open with probability alpha, we replace it by m diodes in parallel. If the diode shorts with probability beta, we replace it by m diodes in parallel. If the diode is open with probability alpha and shorted with probability beta, then it is replaced by a series-parallel or parallel-series array of diodes.

AD-638 729 **Field 9E**
CFSTI Prices: HC$2.00 MF$0.50
Army Electronics Command, Fort Monmouth, N. J.
MICROWAVE SEMICONDUCTOR OSCILLATOR AND AMPLIFIER.
Technical rept.
by Vincent J. Higgins, Frank A. Brand, and Joseph J. Baranowski. Aug 66, 31p ECOM-2738
Proj. DA-1L01300A91A
Task DA-1L01300A91A-54-00

Descriptors: (*Microwave oscillators, Diodes (Semiconductor)), (*Microwave amplifiers, Diodes (Semiconductor)), (*Avalanche diodes, Microwave equipment), Gallium alloys, Arsenic alloys, Silicon, Semiconductor devices, Ionization, Performance, (Engineering).

Identifiers: Gallium arsenide.

P-N junction diodes, both silicon and gallium arsenide, oscillate at microwave frequencies when reverse biased into avalanche. Principal mechanism of oscillation is the creation of a dynamic ac negative resistance through avalanche transit time effects. This report presents details on the performance characteristics of p-n junction avalanche oscillators including description of a signal substitution measurement technique. This technique permits accurate measurement of closely spaced but distinct oscillations without the use of filters and is used to detect, observe, and characterize avalanche oscillation in the frequency range 6 - 50 GHz. Details of experimental results on CW and pulsed oscillations, including rf outputs, dc to rf efficiency, tunability, stability, and parametric effects are given for GaAs oscillators. Comparative oscillation performance of some silicon avalanche oscillators is also given. In addition, details of recent avalanche amplifier investigations are presented. Principal highlights of these avalanche devices are oscillation outputs of over 25 mW at 13 GHz with 5.7% efficiency, 1000 MHz tunable bandwidths for 2:1 power changes; amplifiers are 44 db gain at -60 dbm, and 12 db gain at 0 dbm in the 12 - 15 GHz frequency range. (Author)

AD-638 790 **Field 9E**
CFSTI Prices: HC$1.00 MF$0.50
Army Electronics Command, Fort Monmouth, N. J.
DRIVE REQUIREMENTS FOR HIGH-VOLTAGE LOW-GRID-CURRENT TUBES.
Technical rept.
by George W. Taylor. Aug 66, 16p ECOM-2734
Proj. DA-1P6-22001-A-055
Task 02

Descriptors: (*Modulators, Electron optics), Electron tube parts, Power supplies, Electrical properties, Electron tubes.

Modern hard-tube modulator structures using a magnetic field to focus the electron beam have reduced the intercepted grid current by an order of magnitude. This has resulted in significant reduction in the required drive power. In order to achieve the full current capability of these tubes during the pulse rise time, the displacement current required to discharge the tube and circuit capacitance between grid and plate must be supplied by the driver. Typical calculations and curves showing the effect of the driver current on rise time are included. (Author)

AD-638 871 **Field 9E**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
SENSITIVE STABLE AMPLITUDE DISCRIMINATOR.
by V. A. Fedorov, and G. G. Doroshenko. 6 Jun 66, 9p FTD-TT-65-1819
TT-66-62224
Unedited rough draft trans. of Voprosy Dozimetrii i Zashchity ot Izluchenii (USSR), v3 p77-81 1964.

Descriptors: (*Discriminators, Sensitivity), Stability, Vibrators (Electrical), USSR, Feedback, Circuits.

AD-638 903 **Field 9E, 17C**
CFSTI Prices: HC$1.00 MF$0.50
Navy Electronics Lab., San Diego, Calif.
AMPLITUDE-COMPARISON DIRECTION-FINDING-ANTENNA SYSTEM.
Research rept.
by V. J. Meyers. 22 Jun 66, 18p NEL-1382
Proj. SF-001-08-01
Task 9251

Descriptors: (*Antennas, Direction finding), Beams (Electromagnetic), Errors, Performance (Engineering).

Theoretical study leads to the recommendation that an amplitude-comparison system consisting of eight antennas with a 45-degree beam width be used for the direction finding portion of the small ship direction finding and analysis receiver. An eight-antenna system reduces bearing inaccuracies by a factor of two as compared with a four-antenna system. (Author)

AD-638 913 **Field 9E**
CFSTI Prices: HC$1.00 MF$0.50
Clevite Corp., Bedford, Ohio. Piezoelectric Div.
PRODUCTION ENGINEERING MEASURE FOR CERAMIC FILTERS.
Quarterly rept. no. 13, 30 Mar-29 Jun 66.
by A. Lungo. 29 Jun 66, 23p
Contract DA-36-039-AMC-01471 (E)
See also AD-634 049.

Descriptors: (*Radiofrequency filters, Ceramic materials), (*Ceramic materials, *Filters (Electromagnetic wave)), Manufacturing methods, Resonators.

Pressing, firing, and electroding of ceramic resonators for the preproduction filter samples and the production units was completed. Also, effort was directed toward the processing of resonators through the poling and frequency sorting operations. This effort has not been completed. Ladder filter subassemblies were fabricated and evaluated to determine tentative resonator specifications. This effort is described and discussed. Also discussed is a minor difficulty encountered in the assembly of these filters. (Author)

AD-639 068 **Field 9E**
CFSTI Prices: HC$2.00 MF$0.50
Bunker-Ramo Corp., Canoga Park, Calif. Defense-Systems Div.
PLANAR COAXIAL INTERCONNECTION TECHNIQUES.
Quarterly rept. no. 1, 1 Apr-30 Jun 66.
by H. L. Parks, C. W. Smith, and R. B. Older. Sep 66, 41p F-058
Contract DA-28-043-AMC-02024 (E)
Proj. DA-1E6-22001-A440
Task 1E6-22001-A440-01
ECOM-02024-1

Descriptors: (*Circuit interconnections, Manufacturing methods), Microminiaturization (Electronics), Aluminum alloys, Laminates, Metal plates, Etching.

The object of this work is the development of planar coaxial interconnection techniques that integrate the batch fabrication advantages of printed circuits with the electrical characteristics of point-to-point coaxial wiring by forming coaxial conductors within laminated aluminum plates. Analyses and investigations have been completed on three types of aluminum, eight types of surface preparation, and two types of photo resist; in addition, several combinations of etch solutions and etch times have been studied. Work to date indicates that the aluminum surface can be prepared by mechanical sanding, followed by trichloroethylene vapor cleaning; with this approach, Kodak KMER or KPR is used as the photo resist, 22 degree Baume ferric chloride is used as the etchant, and alloy 1100 aluminum is used as the substrate. An alignment tool, for punching holes in photographic film masks and the aluminum plates to an accuracy of 0.0001 inch, has been fabricated and is being investigated. Results obtained indicate that channels can be etched into aluminum plates with depths controlled to an accuracy of 0.5 mil, that cavity widths can be etched to within plus or minus 1.0 mil, and that the etched channel linearity can be held to within plus or minus 0.3 mil. Preliminary analysis indicates that coaxial lines fabricated into the planar coaxial planes on 0.025-inch centers will provide characteristic impedances and tolerances consistent with the objectives of the program. (Author)

AD-639 100 **Field 9E, 13H**
CFSTI Prices: HC$1.00 MF$0.50
Piezo Crystal Co., Carlisle, Pa.
PEM QUARTZ CRYSTAL UNITS, FILTER LOW FREQUENCY, 1 MC TO 10 MC TYPES CR- (XM-49)/U THRU CR- (XM-52)/U.
Quarterly progress rept. no. 8, Apr-Jun 66.
by A. S. Matistic. 30 Aug 66, 19p
Contract DA-36-039-AMC-03635 (E)

Descriptors: (*Crystal filters, Manufacturing methods), (*Quartz, Crystal filters), Medium frequency, High frequency, Crystal holders, Performance (Engineering).

Conclusions: Techniques and processes, which were successfully applied in fabricating the Preproduction Samples, are adequate for the Production Run. Successive crystal fabrication-in prior development effort and for Reproduction Samples-produced results which are substantially identical. The rejection rate is greater for the unwanted mode test than for all remaining tests combined; unwanted mode rejects range from 0% at 1.75 mc to 50% at 5 mc. Similar results are anticipated for the Production Run. (Author)

AD-639 240 **Field 9E**
CFSTI Prices: HC$1.00 MF$0.50
Army Electronics Command, Fort Monmouth, N. J.
RESISTANCE-CAPACITANCE ACTIVE FILTERS.
Technical rept.
by Eugene J. Chabak. Aug 66, 24p ECOM-2744
Proj. DA-1P6-22001-A-057
Task 1P6-22001-A-057-05

Descriptors: (*Filters (Electromagnetic wave), Functions), Synthesis, Resistors, Capacitors, Circuits, Transistors, Design.

Techniques are presented whereby various filter transfer functions are synthesized utilizing resistors, capacitors and transistors. Low-pass, high-pass and band-pass amplitude characteristics can be attained. Furthermore, complete filtering circuits are presented along with their respective amplitude characteristic and simplified design equations. (Author)

AD-639 377 **Field 9E**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
PARAMETRIC BAND-PASS FILTER.
by V. A. Taft, and E. I. Galynker. 25 Apr 66, 6p
FTD-TT-65-2027
Unedited rough draft trans. of Patent (USSR) 168 529, appl. 905120/26-24, 4 Jun 64.

Descriptors: (*Band-pass filters, Design), USSR, Patents, Pumping (Electronics), Circuits.

The object of the invention is a parametric pass-band filter based on parametrons. To obtain a narrow U-shaped regulable amplitude-frequency characteristic, the source of the filterable signal is connected to the circuits of pumping of two parametrons with amplitude-frequency characteristics shifted onto the pass-band, the output of the first parameter is connected through an inverter to the first input of the matching circuit. The output of the second parametron, the amplitude-frequency characteristic of which is shifted into the region of the lower frequencies, is connected to the second input of the matching circuit (coincidence circuit). (Author)

AD-639 394 **Field 9E, 17I**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Jamestown, R. I. Systems Research Field Lab.
A STUDY OF ALIGNMENT ERRORS BETWEEN THE BEARING CURSOR AND ANTENNA TRACE ON THE PPI OF THE SG-1B (MOD. 50) RADAR.
Memo rept.
by H. L. Lipschultz, and K. O. W. Sandberg. 1 Jul 47, 9p
SPECDEVCEN-166-1-20
Prepared in cooperation with New York Univ., N. Y. Industrial Engineering Lab.

Descriptors: (*Plan position indicators, Errors), Alignment, Direction finding, Performance (Engineering), Search radar.

Identifiers: SG-1B Radar.

The bearing cursor and the antenna trace of the PPI on the SG-1b (Mod. 50) radar are often found to be non-coincident. This report summarizes the results of a study on the alignment of the cursor and of the antenna trace under various conditions. No change in alignment between the antenna trace and bearing cursor was observed after the equipment was in the 'on' position for a six hour period. Slight changes in alignment were observed after the equipment had been in 'stand-by' condition overnight. Larger changes in alignment were observed as a result of movement of the chassis in and out of the console. Computations from these data show the maximum bearing errors resulting from misalignment. (Author)

AD-639 397 **Field 9E**
Not available from CFSTI.
Carlyle Barton Lab., Johns Hopkins Univ., Baltimore, Md.
ZERO-CROSSING PRINCIPLE FOR DETECTING NARROW-BAND SIGNALS.
by A. J. Rainal. 29 Aug 65, 8p Reprint series-14, CBL/64/IMA-3
Contract AF 33 (657)-11029
Availability: Published in IEEE Transactions on Instrumentation and Measurement vIM-15 n1,2 p38-43 Mar-Jun 1966.

Descriptors: (*Detection, Probability), (*Demodulators, Performance (Engineering)), Signals, Narrowband, Radio interference, Radar clutter, Radar signals.

The paper describes a zero-crossing principle for detecting weak narrow-band signals immersed in Gaussian noise. The principle is simple to implement and leads to a zero-crossing detector, comparable in performance to a square-law detector. The zero-crossing principle has many of the properties associated with the incoherent phase principle of signal detection. Unlike the square-law detector, the zero-crossing detector is relatively insensitive to system gain fluctuations. Probability of false alarm and probability of error are presented for both the square-law detector and the zero-crossing detector. An application of the zero-crossing principle to the problem of incoherent detection of a stationary radar target in clutter is discussed. (Author)

AD-639 434 **Field 9E**
CFSTI Prices: HC$2.00 MF$0.50
Washington Univ., Seattle. Dept. of Electrical Engineering.
EQUALLY SPACED SPHERICAL ARRAY.
Technical rept.
by Andrew K. Chan, Akira Ishimaru, and Rubens A. Sigelmann. Feb 66, 45p TR-97
Contract AF 19 (628)-2763
Proj. AF-5635
Task 563502
AFCRL-66-532

Descriptors: (*Antenna arrays, Spheres), Antenna radiation patterns, Gain, Bandwidth, Numerical methods and procedures.

The report presents a new method of analyzing the radiation characteristics of a spherical array. The existing method of finding the characteristics of an array on a curved surface using computers does not provide a means of predicting the side-lobe level and beamwidth of the pattern. In this report, the theory of unequally spaced arrays developed by Ishimaru is applied to this problem and

the radiation characteristic is found to behave as sin (u)/u. The elements of the array are arranged as a series of circular arrays of different radii on the spherical surface. The resulting radiation pattern for constant amplitude and element spacing of one wave length is discussed in detail. The validity of the theory is demonstrated by an experimental spherical array which employs half-wavelength dipole elements on an Eccoform sphere. Due to the difficulty of exciting each element of the array a plane wave is used to excite the array. Scattered wave is measured and compared with the theory. (Author)

AD-639 493 **Field 9E, 6D**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
TELEVISION ARRANGEMENT FOR AUTOMATIC RECOGNITION OF OBJECTS.
by A. M. Khalfin. 28 Jun 66, 7p FTD-HT-66-84
Unedited rough draft trans. of Patent (USSR) 164 627, appl. 826968/26-24, 21 Mar 63.

Descriptors: (*Pattern recognition, *Television equipment), Fiber optics, Photomultipliers, Image tubes, Electron optics, Patents, USSR.

Identifiers: Rasters.

Television devices for automatic recognition of objects are known, containing an optical system for image projection of the recognized object on a photocathode of an electron-optical image transformer, connected to the recognition block and provided with an image transformer in a digital code, and connected decoding matrices with the transformer. The proposed television device differs from the known ones by the fact, that in the recognition block a face plate is used, consisting of a group of glass fibers, forming the analyzing raster, completed with a photomultiplier, connected to image transformer register triggers, and an additional raster, situated around the analyzing raster. The output of the decoding matrix is connected with the step scanning block of the electron-optical transformer. Such a fulfillment of the device allows the rate of recognizing objects to increase. (Author)

AD-639 509 **Field 9E, 9A**
Not available from CFSTI.
Technion - Israel Inst. of Tech., Haifa. Dept. of Electrical Engineering.
TERNARY-TRANSMISSION CONTACT NETWORKS.
Revised ed.
by Michael Yoeli. 5 Jan 65, 6p
Grant AF-EOAR-65-63
Proj. AF-9749
Task 974901
AFOSR-66-1219
Revision of manuscript submitted 13 Aug 64. Prepared in cooperation with Stanford Research Inst., Menlo Park, Calif. Dept. of Mathematical Sciences.
Availability: Published in IEEE Transactions of Circuit Theory vCT-12 n3 p414-7 Sep 1965.

Descriptors: (*Electrical networks, Electric terminals), Synthesis, Algebra, Rectifiers, Israel.

This communication discusses multiterminal two-positional contact networks which include resistors and (ideal) rectifiers. Ternary transmission values are considered, namely 0 (open circuit), 1/2 (partial short circuit), and 1 (short circuit). It introduces a special binary-ternary switching algebra and demonstrates its suitability to the analysis of such ternary-transmission contact networks. This algebra is to be distinguished from the ternary algebras used e.g., in connection with ternary voltage switching circuits or for the study of static hazards of binary switching circuits. (Author)

AD-639 577 **Field 9E**
CFSTI Prices: HC$3.00 MF$0.75
Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
ACTIVE AND PASSIVE BAND-PASS FILTERS WITH LINEAR PHASE.
Master's thesis.
by Gerald Francis Allsman. Jun 66, 64p GGC/EE/66-1

Descriptors: (*Band-pass filters, Phase (Electronics)), Gain, Performance (Engineering), Design, Tunnel diodes.

A new type of pole-residue, linear phase, band-pass filter, originally presented by Robert Lerner in 1964, is analyzed, its method extended, and suggested improvements given. A different method of describing the filter parameters is given and equations are developed that allow a wide latitude in adjusting the system gain and pole locations to achieve desired in-band magnitude and magnitude ripple relationships. A quantitative comparison of the filter is made with the Chebyshev, Butterworth, and Thomson filters. Suggested unbalanced network realizations are given using Negative Impedance Converters and Tunnel Diodes. (Author)

AD-639 590 **Field 9E**
CFSTI Prices: HC$14.60 MF$1.00
Radio Corp. of America, Camden, N. J. Communications Systems Div.
INTRODUCTION TO THE DESIGN AND APPLICATION OF MICROMODULES.
Sep 63, 144p
Contract DA-36-039-sc-75968

Descriptors: (*Microminiaturization (Electronics), *Modules (Electronics)), Design, Electronic equipment, Manufacturing methods, Reliability (Electronics).

Contents: The micromodule concept; micromodule design principles; construction of experimental micromodules; procurement specifications; design of micromodular equipment; tools and procedures for assembly, testing and servicing of micromodular equipment; micromodule applications.

N66-24285 **Field 9E**
CFSTI Prices HC$1.00 MF$0.50
Comitato Nazionale Per L Energia Nucleare, Frascati (Italy).
THE RADIO FREQUENCY SYSTEM OF THE MICROTRON.
Il Sistema Di Radio Frequenza Del Microtrone
by U. Bizzarri, and A. Vignati. 28 Dec 65, 12p LNF-65/50
In Italian Its Nota Interna No. 301

Descriptors: Current, Electric, Energy, Frequency, Measurement, *Microtron, Model, Radio, *Radio frequency, Resonant, *Resonant frequency, *Resonator, System.

For abstract, see S 04 13.

N66-24441 **Field 9E**
CFSTI Prices HC$2.00 MF$0.50
Deutsche Versuchsanstalt Fur Luft- Und Raumfahrt, Mulheim An Der Ruhr (West Germany).
OUTLINE OF A GENERALLY APPLICABLE METHOD FOR ANALYZATION OF AUTOMATIC CONTROL SYSTEMS WITH CONTROLLED RECTIFIERS BY A THEORY OF SAMPLED SYSTEMS.
Entwurf Einer Allgemein Anwendbaren Methode Zur Behandlung Von Regelkreisen Mit Stromrichterstellglieder
n Mit Hilfe Der Abtasttheorie
by J. Martin. Feb 66, 30p DVL-515, DLR-FB-66-05
In German, English Summary

Descriptors: Analysis, Automatic, *Automatic control, Behavior, Circuit, Control, *Control system, Input, Rectifier, Regulation, *Sampling, Signal, System, Theory.

For abstract, see S 04 13.

N66-35117 **Field 9E**
CFSTI Prices HC$2.00 MF$0.50
Norwegian Defence Research Establishment, Kjeller.
ACOUSTIC AMPLIFICATION - A DISCUSSION OF APPLICATIONS INTERIM SCIENTIFIC REPORT NO. 11.
by K. Blotekjaer. 15 Jan 66, 43p E-74, AFCRL-66-431
Contract AF 61/052/-484

Descriptors: *Acoustics, *Amplifier, Bandwidth, Consumption, Crystal, Delay, Efficiency, Electric, Equipment, Gain, Line, *Piezoelectric crystal, Piezoelectricity, Power, Radiation, Signal, Ultrasonic, *Ultrasonic radiation.

For abstract, see S 04 20.

PB-170 856 **Field 9E, 17C**
CFSTI Prices: HC$3.60 MF$0.50
ITT Federal Labs., Nutley, N. J.
DEVELOPMENT OF DIRECTIONAL GLIDE-SLOPE ARRAY.
Interim rept.
by Glen Lehman, and F. W. Iden. Apr 65, 33p
Contract FA-WA-4465
Proj. FAA-320-101-01N (114-11)
SRDS-RD-65-41

Descriptors: (*Antenna arrays, *Direction finding), Design, Construction, Operation.

The report covers the design, development, construction, and testing of a directional glide-slope antenna system that is compatible with standard airborne receiving equipment. The design effort resulted in an array of thirty dipole radiators which are fed in such phases and amplitudes as to produce an on-course signal on a plane perpendicular to and bisecting the axis of the array. The array is designed to radiate minimun energy in the sector from three to nine degrees below path, in order to minimize the effects of the terrain in front of the antenna upon the path shape. The array of dipoles is mounted on a 72-foot tower whose angle with respect to vertical is adjustable between 2.5 and 3.3 degrees, thereby permitting the glide slope to be adjusted through the same angle. The antenna was installed at ITT Federal Laboratories facilities in Lincoln Park, New Jersey, and preliminary flight tests were made at this location. (Author)

PB-170 938 **Field 9E, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
PREAMPLIFIER MODEL 1A1 (TEKTRONIX).
Technical manual instrument calibration procedure, AA-37.
15 Mar 66,24p
NAVWEPS-17-20AA-37

Descriptors: (*Preamplifiers, Calibration), Specifications, Test methods, Instruction manuals.

The procedure describes the calibration of the Tektronix 1A1 dualtrace preamplifier. The preamplifier is a plug-in, wide-band, dual-channel, high gain preamplifier used with oscilloscopes. It provides calibrated step attenuation, vertical positioning controls, and either a-v or d-v coupling for either of two inputs.

PB-170 985 **Field 9E, 14B**
CFSTI Prices: HC$1.00 MF$0.50
SSCO Standards Lab., Inc., Southfield, Mich.
CW FILTER AIRTRON 407655.
Technical manual instrument calibration procedure AN-10.
1 Jun 66, 11p
Contract N123 (62861)35059A
NAVWEPS-17-20AN-10
This publication supersedes NAVWEPS 17-20AN-10 dated 1 December 1965.

Descriptors: (*Band-pass filters, Calibration), Superhigh frequency, Specifications, Test methods.

The procedure describes the calibration of an Airtron Model 407655 C. W. Filter, which essentially passes any signal in the frequency range from 5.4 to 5.75 Gc.

PB-173 086 **Field 9E, 9C**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
INDUCTIVE VOLTAGE DIVIDERS.
Technical manual instrument calibration procedure AE-38.
1 Jun 66, 15p
NAVAIR-17-20AE-38

Descriptors: (*Voltage dividers, Calibration), Inductance, Specifications, Test methods.

The procedure describes the calibration of inductive voltage dividers.

PB-173 110 **Field 9E, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
PREAMPLIFIER TEKTRONIX TYPE Z.
Technical manual instrument calibration procedure, AA-28.
1 Jun 66, 17p
NAVWEPS-17-20AA-28
This publication supersedes the interim edition released by the Metrology Engineering Center on 1 July 1964.

Descriptors: (*Preamplifiers, Calibration), Broadband, Pulse height analyzers, Specifications, Test methods.

The procedure describes the calibration of the Tektronix type Z plugin preamplifier. The instrument being calibrated will be referred to herein as the Test Instrument. The preamplifier is a plug-in differential preamplifier used with Tektronix oscilloscopes. It may be used as a conventional wide-band, high-gain preamplifier, a differential input preamplifier, or as a calibrated differential comparator. (Author)

AD-639 058 **See Field 17B**

AD-639 108 **See Field 9A**

AD-639 211 **See Field 20I**

AD-639 290 **See Field 5H**

AD-639 356 **See Field 11D**

AD-639 367 **See Field 17I**

AD-639 368 **See Field 17I**

AD-639 371 **See Field 17I**

AD-639 374 **See Field 17I**

AD-639 587 **See Field 18D**

N66-35066 **See Field 20N**

PB-170 733 **See Field 17G**

PB-170 804 **See Field 17A**

9F. TELEMETRY

N66-24116 **Field 9F**
CFSTI Prices HC$1.00 MF$0.50
Harvard Univ., Cambridge, Mass.
RADIATED POWER AND OHMIC LOSS OF THE INFINITELY LONG CYLINDRICAL ANTENNA SCIENTIFIC REPORT NO. 6.
by L.-C. Shen, and T.-T. Wu. Feb 66, 24p
NASA-CR-74226
Grant NSG-579

Descriptors: *Antenna, Conductivity, Conductor, Cylinder, *Impedance, Input, Internal, Long, Loss, Metal, Ohm, *Ohmic loss, Perfect, Power, Radiative.

For abstract, see S 04 13.

N66-24121 **Field 9F**
CFSTI Prices HC$6.00 MF$1.00
Hughes Aircraft Co., Culver City, Calif.
STUDY OF SPACECRAFT ANTENNA SYSTEMS INTERIM ENGINEERING REPORT (FINAL), OCT. 1963 - JAN. 1965.
by W. H. Kummer, and A. T. Villeneuve. 1965, 263p NASA-CR-71797, P65-35
Contract NAS5-3545

Descriptors: Antenna, Array, Beam, Communication, Component, Control, Electronic, *Electronic control, Link, Relay, Satellite, Spacecraft, *Spacecraft communications system, Steering, System, Tracking, *Tracking antenna.

For abstract, see S 04 13.

N66-24383 **Field 9F**
CFSTI Prices HC$4.00 MF$0.75
Wheeler Labs., Inc., Great Neck, N. Y.
STUDY OF SMALL OMNIDIRECTIONAL 250-MC ANTENNA FOR PENETROMETER FINAL REPORT.
by R. E. Puttre. 29 Jul 65, 107p NASA-CR-66091
Contract NAS1-4470
Its Rept.-1291

Descriptors: Antenna, Characteristics, Loop, Lunar, *Lunar surface, Moon, Omnidirectional, *Omnidirectional antenna, Pattern, *Petrography, Quadrature, Small, Sphere, Study, Surface.

For abstract, see S 04 13.

N66-24394 **Field 9F**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PHASE STABILITY ASPECTS OF THE GSFC BORESIGHT RF SOURCES.
by B. W. Reich. 7 Jan 66, 15p NASA-TM-X-55448, X-523-66-13

Descriptors: Boresight, Communication, Device, Evaluation, Jitter, Modulation, Oscillator, Phase, *Phase modulation, Radar, *Radar system, Solid, *Solid state device, Space, *Space communication, Stability, *Stable oscillation, State, System, Transistor.

For abstract, see S 04 13.

N66-24397 **Field 9F**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FUNCTIONAL DESCRIPTION OF THE APOLLO UNIFIED S-BAND DATA TRANSMISSION LINKS.
by J. J. Schwartz. 1 Feb 66, 48p NASA-TM-X-55453, X-506-66-36

Descriptors: *Apollo project, Data, *Data transmission, Function, Installation, *Link, *S-band, Station, System, Telecommunication, Tracking, *Tracking station, Transmission.

For abstract, see S 04 13.

N66-24487 **Field 9F**
CFSTI Prices HC$4.00 MF$0.75
Ryan Electronics, San Diego, Calif.
RYAN MODEL 520 RADAR ALTIMETER FINAL ENGINEERING REPORT.
by H. T. Hoffman, and N. L. Olthoff. 1 Sep 63, 108p NASA-CR-74546
Contract NAS8-2459

Descriptors: Altimeter, Breadboard, Design, Electronic, *Electronic equipment testing, Engineering, Equipment, Fabrication, High altitude, *Instrumentation, Launch vehicle, Model, Pulse, Radar, *Radar altimeter, Saturn, *Saturn launch vehicle, Testing.

For abstract, see S 04 13.

N66-24602 **Field 9F**
CFSTI Prices HC$3.00 MF$0.75
Hughes Aircraft Co., Culver City, Calif.
HIGH-GAIN, SELF-STEERING ANTENNA SYSTEM, ENGINEERING MODEL DESIGN REVIEW REPORT.
by R. A. Birgenheier, and C. Lew. Mar 66, 95p
NASA-CR-74260, P-66-68
Contract NAS5-10101

Descriptors: Adaptation, Antenna, *Antenna array, Array, Communication, Component, Design, Engineering, High gain, Model, Module, Power, Satellite, *Satellite communication, *Self-adaptive system, Self-regulating, *Steerable antenna, Steering.

For abstract, see S 04 13.

N66-24939 **Field 9F**
CFSTI Prices HC$5.00 MF$1.25
Space Technology Labs., Inc., Redondo Beach, Calif.
STUDY OF SPACECRAFT TRANSPONDER POWER AMPLIFIER FINAL REPORT.
by R. R. Cagnon, K. E. Lytal, and S. D. Mc caskey. Aug 64, 200p NASA-CR-74775, STL-4104-6001-RU-000
Contract NAS5-3423

Descriptors: Characteristics, Communications, *Communications satellite, Conversion, Direct, Feasibility, Frequency, Gain, Noise, Radio, *Radio frequency, Satellite, *Transponder, Travel, *Traveling wave tube, Tube, Wave.

For abstract, see S 04 13.

N66-24958 **Field 9F**
CFSTI Prices HC$4.00 MF$0.75
Hughes Aircraft Co., Culver City, Calif.
SPACECRAFT ANTENNA SYSTEMS FINAL ENGINEERING REPORT, OCT. 1963 - JAN. 1966.
by R. A. Birgenheier, and W. H. Kummer. Mar 66, 120p NASA-CR-74728, P66-66
Contract NAS5-3545

Descriptors: Antenna, *Antenna array, Array, Breadboard, Communications, Design, Helical, *Helical antenna, Reliability, Retrodirecting, Satellite, Scanning, Signal, Spacecraft, *Spacecraft communications system, *Steerable antenna, Steering, System, Transmitter.

For abstract, see S 04 13.

N66-24961 **Field 9F**
CFSTI Prices HC$3.00 MF$0.75
Planning Research Corp., Washington, D. C.
GEOS COMMAND ASSIGNMENT.
by C. E. Bloomquist. 31 Mar 66, 70p NASA-CR-74738, PRC-D-1190
Contract NASW-1180
Its Tech. Advisement Memo. No.-106-13

Descriptors: Assignment, Command, *Command system, Communication, Criterion, Flip-flop, Function, Logic, Matrix, Operational, Position, Probability, Relay, Reliability, Satellite, *Satellite communication, Spacecraft, State, System, Table, Unit.

For abstract, see S 04 13.

N66-25012 Field 9F
CFSTI Prices HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
TRACKING AND DATA ACQUISITION REPORT - MARINER MARS 1964 MISSION. VOLUME I - NEAR- EARTH TRAJECTORY PHASE.
by N. A. Renzetti. 1 Jan 65, 80p NASA-CR-74847, JPL-TM-33-239
Contract NAS7-100

Descriptors: Acquisition, Data, *Data acquisition, Earth, Ground, *Ground support system, *Mariner c program, Mariner c spacecraft, Near, Spacecraft, *Spacecraft tracking, Support, System, Tracking, Trajectory.

For abstract, see S 04 13.

N66-25555 Field 9F
CFSTI Prices HC$2.00 MF$0.50
Trw Systems, Redondo Beach, Calif.
EVALUATION OF THE USE OF POWERED FLIGHT TRACKING AND TELEMETRY DATA IN LUNAR ORBIT DIFFERENTIAL CORRECTION PROCEDURES.
by D. H. Lewis. 1966, 45p NASA-CR-66064
Contract NAS1-4605-3

Descriptors: Calculation, Correction, Data, Differential, Flight, *Flight path, Lunar, *Lunar satellite, Maneuver, Orbit, *Orbit calculation, Path, Powered, Satellite, *Satellite orbit, Spacecraft, *Spacecraft maneuver, State, *State vector, Telemetry, Tracking, Vector.

For abstract, see S 04 14.

N66-25559 Field 9F
CFSTI Prices HC$3.00 MF$0.75
Motorola, Inc., Scottsdale, Ariz.
INTEGRATED CIRCUIT APPLICATION TO APOLLO UDL FINAL REPORT.
by R. H. Herring. 28 Jul 65, 88p NASA-CR-65338
Contract NAS9-3458
Its Rept.-3030-1-10

Descriptors: *Apollo spacecraft, Circuit, Data, *Data link, *Decoder, Digital, Electronic, *Electronic equipment, Engineering, Equipment, *Integrated circuit, Integration, Link, Miniaturization, Model, Power, Reduction, Size, Spacecraft, Weight.

For abstract, see S 04 14.

N66-25574 Field 9F
CFSTI Prices HC$5.00 MF$1.25
Radio Corp. Of America, Moorestown, N. J.
BURST TRANSMISSION OF PCM DATA STUDY FINAL REPORT.
Mar 66, 188p NASA-CR-65346
Contract NAS9-4244

Descriptors: Asynchronous, Burst, Code, Data, Feasibility, Modulation, Multiple, Pcm, Periodic, Pulse, *Pulse code modulation (pcm), Radio, *Radio transmission, *Telemetry, Transmission.

For abstract, see S 04 14.

N66-25580 Field 9F
CFSTI Prices HC$4.00 MF$0.75
Melpar, Inc., Falls Church, Va.
THIN- FILM PERSONAL COMMUNICATIONS AND TELEMETRY SYSTEM (TFPCTS) THIRD QUARTERLY REPORT, 21 JUN. - 21 SEP. 1965.
by B. J. Weiner. Oct 65, 103p NASA-CR-65356
Contract NAS9-3924

Descriptors: Base, Cadmium, *Circuit, Communication, *Communication system, Design, Device, Diode, Fabrication, Film, High frequency, Metal, Method, Semiconductor, *Semiconductor device, Specification, Sulfide, System, *Telemetry, Telluride, Tellurium, Thin, *Thin film, *Transistor, *Triode, Varactor.

For abstract, see S 04 14.

N66-26125 Field 9F
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
DESCRIPTION AND ANALYSIS OF 890- MHZ NOISE-MEASURING EQUIPMENT.
by K. W. Biber, and A. C. Whittlesey. 31 Mar 66, 20p NASA-CR-74888, JPL-TR-32-898
Contract NAS7-100

Descriptors: Amplitude, Band, Bandwidth, Continuous, Frequency, *Frequency band, Interference, Measurement, Narrow, Noise, *Noise measurement, Output, Radio, *Radio interference, Ranger satellite, Receiver, Signal, Spacecraft, Wave.

For abstract, see S 04 14.

N66-26261 Field 9F
CFSTI Prices HC$1.00 MF$0.50
Ohio State Univ. Research Foundation, Columbus.
RECEIVER TECHNIQUES AND DETECTORS FOR USE AT MILLIMETER AND SUBMILLIMETER WAVELENGTHS SEMIANNUAL REPORT, 1 OCT. 1965 - 31 MAR. 1966.
1 Apr 66, 11p NASA-CR-74971
Grant NSG-74-60
Its Rept.-1093-30

Descriptors: Absorption, *Absorption spectrum, Analog, *Analog-to-digital converter, Carbon dioxide, Converter, Digital, Gas, *Gas laser, Glass, Laser, Recorder, Spectrum, Submillimeter, *Submillimeter wave, *Water vapor, Wave.

For abstract, see S 04 14.

N66-26282 Field 9F
CFSTI Prices HC$6.00 MF$1.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TELEMETRY ON-LINE MONITORING, COMPRESSION, AND TRANSMISSION (TOMCAT) SYSTEM FOR THE MANNED SPACE FLIGHT NETWORK. VOLUME 5 - TOMCAT-II - 2KB DATA TRANSMISSION PROGRAM.
by R. Des jardins, and L. H. Wentz Jr. Mar 65, 246p NASA-TM-X-55485, X-546-65-116

Descriptors: Coding, Compression, Data, *Data transmission, Flight, Flow, *Gemini project, Manned, *Manned space flight, Monitor, Space, *Telemetry, Transmission.

For abstract, see S 04 14.

N66-26700 Field 9F
CFSTI Prices HC$1.00 MF$0.50
Computer Control Co., Inc., Framingham, Mass.
PCM-FM, PAM-FM/FM SIMULATOR FINAL REPORT.
16 Apr 66, 11p NASA-CR-75071
Contract NAS8-11589
Its Doc.-130071556

Descriptors: Amplitude, Calibration, Code, Design, Equipment, Fabrication, *Generator, Ground, Modulation, Pam, Pattern, Pcm, Pulse, Pulse amplitude modulation (pam), Pulse code modulation (pcm), *Pulse modulation, Simulator, *Telemetry, Test, Vehicle.

For abstract, see S 04 14.

N66-26763 Field 9F
CFSTI Prices HC$3.00 MF$0.50
General Electric Co., Cocoa Beach, Fla.
SINGLE PARAMETER TESTING, PHASE D FINAL REPORT.
by E. L. Berger, C. A. Grunden, and J. T. Sterling. Apr 66, 53p NASA-CR-75258
Contract NAS8-11715
Its Rept.- 66-simar-10417

Descriptors: Accelerometer, Amplifier, Apparatus, Component, *Component reliability, Electronic, *Electronic equipment, Equipment, Gyroscope, Measurement, *Measuring apparatus, Meter, Method, Reliability, Test, *Test method, Transducer.

For abstract, see S 04 14.

N66-34310 Field 9F
CFSTI Prices HC$3.25 MF$1.00
Computing Devices Of Canada, Ltd., Ottawa (Ontario).
HIGH-SHOCK FM TRANSMITTER FINAL REPORT, PHASE I.
by J. R. Beck, G. E. Brown, and J. E. Dawson. 22 Oct 65, 154p NASA-CR-66159
Contract NAS1-5042
Its Rept.-7060/fri

Descriptors: Capacitor, Circuit, Component, *Component reliability, Electronic, Frequency, *Frequency modulation, Impact, Modulation, Pendulum, *Radio transmitter, Reliability, Sensitivity, Shock, *Shock sensitivity, Stress, Testing.

For abstract, see S 04 20.

N66-34318 Field 9F
CFSTI Prices HC$2.00 MF$0.50
Melpar, Inc., Falls Church, Va.
THIN- FILM PERSONAL COMMUNICATIONS AND TELEMETRY SYSTEM (TFPCTS) FIRST QUARTERLY PROGRESS REPORT, 24 MAR. - 24 JUN. 1966.
Jul 66, 50p NASA-CR-65457
Contract NAS9-3924

Descriptors: Circuit, Coating, *Communication system, Communications, Electronic, *Electronic packaging, Film, Filter, Masking, Module, Oscillator, Packaging, Personal, Silicone, System, *Telemetry, Thin, *Thin film, Transistor, *Transistor circuit.

For abstract, see S 04 20.

N66-34375 Field 9F
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Ames Research Center, Moffett Field, Calif.
ERROR RATE REDUCTION OF PARITY CHECKED TELEMETRY DATA BY LIKELIHOOD DELETION STRATEGY.
by D. R. Lumb, and F. Neuman. Aug 66, 46p NASA-TN-D-3576
Contract 125-23-02-02

Descriptors: Code, Communication, Correction, Data, Deletion, Demodulation, Device, Error, *Error correcting device, Information, Model, Probe, Processing, Space, *Space communication, *Telemetry, Theory, Word.

For abstract, see S 04 20.

N66-34405 Field 9F
CFSTI Prices HC$2.50 MF$0.75
Computing Devices Of Canada, Ltd., Ottawa (Ontario).
HIGH SHOCK FM TRANSMITTER FINAL REPORT, PHASE II.
by J. R. Beck, G. E. Brown, and J. E. Dawson. 14 May 66, 92p NASA-CR-66160
Contract NAS1-5042
Its Rept.-7061/r2

Descriptors: Capacitor, Circuit, Communication, Design, Electric, Frequency, *Frequency modulation, *Impact, Load, Radio, *Radio transmitter, Shock, *Shock load, Stability, System, Testing, Transmitter.

For abstract, see S 04 20.

N66-34406 **Field 9F**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SPECTRAL ANALYSIS APPLIED TO A DIGITALLY CODED PM RF CARRIER.
by R. C. Woodbury. 15 Aug 66, 19p NASA-CR-77311, JPL-TR-32-893
Contract NAS7-100

Descriptors: Analysis, Calibration, Carrier, Coding, Digital, *Digital technique, Frequency, Function, Modulation, Phase, *Phase modulation, Radio, *Radio frequency, Spectral, *Spectral analysis, Square, Technique, Wave.

For abstract, see S 04 20.

N66-34638 **Field 9F**
CFSTI Prices HC$4.00 MF$1.00
Alabama Univ., University.
STATISTICAL QUALITY CONTROL APPLIED TO A TELEMETRY SYSTEM ACCEPTANCE PRODEDURE TECHNICAL REPORT NO. 13.
by M. A. Griffin, H. P. Hassell Jr, R. S. Simpson, and W. S. Spivey. Jun 66, 117p NASA-CR-77305
Contract NAS8-20172

Descriptors: Acceptance, Analysis, Chart, Control, Procedure, Quality, *Quality control, Statistical, *Statistical analysis, *Telemetry.

For abstract, see S 04 20.

N66-34684 **Field 9F**
CFSTI Prices HC$4.00 MF$1.00
Radiation Systems, Inc., Alexandria, Va.
A HIGH-GAIN OMNIDIRECTIONAL SATELLITE ANTENNA TECHNIQUE FINAL REPORT.
by G. G. Chadwick, J. E. Hill, and P. Kerr. 3 Oct 65, 146p NASA-CR-77236, TR-68
Contract NAS5-3947

Descriptors: Airborne, *Airborne equipment, Antenna, *Antenna array, Array, Circular, Design, Device, Equipment, High gain, Multiple, Omnidirectional, *Omnidirectional antenna, Planar, Satellite, Satellite-borne, Solid, *Solid state device, State, Switch, System, *Systems design.

For abstract, see S 04 20.

N66-34702 **Field 9F**
CFSTI Prices HC$6.00 MF$1.25
Sperry Phoenix Co., Ariz.
STUDY OF APPLICATIONS OF A TRACKING FILTER TO STABILIZE LARGE FLEXIBLE LAUNCH VEHICLES FINAL TECHNICAL REPORT.
by D. C. Cunningham, and R. L. Schaeperkoetter. May 66, 217p NASA-CR-77353, LJ-1201-0609
Contract NAS8-20080

Descriptors: Adaptive, *Adaptive filter, Bending, Control, Dynamics, Error, Filter, Frequency, Gain, *Launch vehicle, Mode, Phase, Stabilization, Statics, Tracking, *Tracking filter.

For abstract, see S 04 20.

N66-34794 **Field 9F**
CFSTI Prices HC$3.00 MF$0.75
Auburn Research Foundation, Inc., Ala.
THE DESIGN OF A HYBRID-TYPE S-BAND DIODE PHASE SHIFTER TECHNICAL REPORT NO. 1.
by E. R. Graf. 16 May 66, 69p NASA-CR-77420
Contract NAS8-20557

Descriptors: Antenna, Apparatus, Array, Bit, Control, Design, Diode, Four, Hybrid, Loss, *Microwave apparatus, *P-i-n diode, Phase, *Phase shift, Ring, *S-band, Shift, Technique.

For abstract, see S 04 20.

N66-34934 **Field 9F**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FOUR PARAMETER PULSE HEIGHT ANALYZER.
by C. A. Cancro, N. M. Garrahan, and R. G. Mc gowan. Jul 66, 17p NASA-TM-X-55553, X-711-66-327

Descriptors: *Amplifier, *Analyzer, Channel, Charge, Circuit, *Converter, Design, Height, Input, Output, Parameter, *Parametric amplifier, Pulse, *Pulse height, *Readout, System.

For abstract, see S 04 20.

N66-35169 **Field 9F**
CFSTI Prices HC$4.00 MF$1.00
Auburn Research Foundation, Inc., Ala.
AUTOMATICALLY SCANNED ANTENNA SYSTEMS FINAL REPORT.
by H. M. Summer. 20 Jan 66, 131p NASA-CR-77443
Contract NAS8-11251

Descriptors: Airborne, *Airborne range and orbit determination (arod) p, Antenna, Arod, Array, Determination, Digital, Direction, Electronic, Fabrication, Finder, Orbit, *Phase shift, *Radar direction finder, Range, Station, Switching, System, Testing, Tracking, *Tracking antenna, Transponder.

For abstract, see S 04 20.

N66-35208 **Field 9F**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
DESIGN EQUATIONS OF SWEPT FREQUENCY SPECTRUM ANALYZERS FOR IN-FLIGHT VIBRATION ANALYSIS.
by E. F. Miller, and D. L. Wright. Sep 66, 34p NASA-TN-D-3611
Contract 125-24-03-03-22

Descriptors: Airborne, *Airborne equipment, Analysis, Analyzer, Communication, Data, Design, Equation, Equipment, Frequency, In-flight, Measurement, Reduction, Signal, *Signal analyzer, *Spectral analysis, Spectrum, Sweep, *Sweep frequency, Transmission, Vibration.

For abstract, see S 04 20.

N66-35233 **Field 9F**
CFSTI Prices HC$4.00 MF$1.00
Alabama Univ., University.
ANALYSIS OF THE LINEARITY CHARACTERISTICS, TAPE RECORDERS AND COMPENSATION EFFECTS IN THE FM/FM TELEMETRY SYSTEM.
by M. K. Brown, M. A. Griffin, H. P. Hassell Jr, J. J. Jarvis, and R. S. Simpson. Mar 66, 145p NASA-CR-77503
Contract NAS8-20172
Its Tech. Rept.-11

Descriptors: Communication, *Compensation, Error, Frequency, Instability, *Linearity, Modulation, Nonlinearity, Recorder, Saturn launch vehicle, Spacecraft, Speed, System, Tape, *Tape recorder, *Telemetry.

For abstract, see S 04 20.

PB-172 872 **Field 9F, 4B**
CFSTI Prices: HC$1.60 MF$0.50
National Center for Atmospheric Research, Boulder, Colo.
THE NCAR DROPSONDE PROGRAM.
by Robert H. Bushnell. Jan 66, 11p Technical notes NCAR-TN-13
Research supported in part by NSF.

Descriptors: (*Radiosondes, Design), Atmospheric sounding, Thunderstorms, Telemeter systems, Parachute descents.

The dropsonde is intended to secure measurements within thunderstorms, by dropping several sondes nearly simultaneously into the top of a storm cell. Each sonde will be tracked and will telemeter sounding data to the ground. Data from several sondes, falling simultaneously, will be needed to make it possible to distinguish between spatial structures and development in time. The falling sondes must be considerably less than 500 m apart horizontally, a distance which is expected to be the order of diameter of a strong active updraft. (Author)

10A. CONVERSION TECHNIQUES

AD-639 514 **Field 10A, 7D, 20M**
Not available from CFSTI.
Weizmann Inst. of Science, Rehovoth (Israel). Polymer Dept.
MECHANOCHEMISTRY.
by A. Katchalsky, and A. Oplatka. 20 Jul 66, 27p
Grant AF-EOAR-62-58
Proj. AF-9777
Task 977701
AFOSR-66-1460
Availability: Published in Proceedings of International Congress Rheology (4th) p73-97.

Descriptors: (*Energy conversion, Thermodynamics), (*Collagen, Energy conversion), (*Engines + motors, Energy conversion), Electrolytes, Polymers, Energy, Contraction, Melting, Loading (Mechanics), Israel.

Identifiers: Mechanochemistry, Mechanochemical machines.

Consideration is given to the development of the mathematics relating the conversion of chemical energy to mechanical work, without the necessity of a 'heat-engine' viewpoint. The thermodynamics of the system of this conversion is given in detail and some of the mechanisms are subject to formal mathematical expression. This treatment yields a coherent theory for the mechano-chemical engine. (Author)

AD-639 532 **Field 10A, 6D**
Not available from CFSTI.
Weizmann Inst. of Science, Rehovoth (Israel). Dept. of Biophysics.
CHEMICAL ENGINES.
by Robin Clarke, and Aaron Katchaisky. Mar 66, 8p
Grant AF-EOAR-25-64
Proj. AF-9777
Task 977701
AFOSR-66-0967
Availability: Published in Science Journal p80-84 Mar 1966.

Descriptors: (*Engines + motors, Energy conversion), (*Collagen, *Energy conversion), Electrolytes, Polymers, Contraction, Membranes, Israel.

Identifiers: Mechanochemical machines.

The report, presented in verbatim interview form, concerns the development of a machine which converts chemical energy directly into mechanical form. Consideration is given to the implications the machine has for both technology and the life sciences.

N66-24496 Field 10A
CFSTI Prices HC$1.00 MF$0.50
Clevite Corp., Cleveland, Ohio.
STUDY OF THIN FILM LARGE AREA PHOTOVOLTAIC SOLAR ENERGY CONVERTER FIRST QUARTERLY REPORT, 25 OCT. 1965 - 24 JAN. 1966.
by F. Augustine, W. K. Bower, J. R. Hietanen, and F. A. Shirland. 28 Feb 66, 23p NASA-CR-74581
Contract NAS3-8502

Descriptors: Adhesive, Cadmium, *Cadmium sulfide, Cell, Converter, Copper, Cycling, Degradation, Design, Energy, *Energy converter, Epoxy, Fabrication, Film, Gold, Grid, Photovoltaic, *Photovoltaic cell, Silver, Solar, *Solar energy, Stability, Storage, Sulfide, Temperature, Thin, *Thin film, Transient.

For abstract, see S 04 13.

N66-24536 Field 10A
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
A COMPARISON OF SOLAR CELL DAMAGE BY ALPHA PARTICLES AND PROTONS.
by J. W. Blue, and A. B. Smith. May 66, 15p NASA-TN-D-3427

Descriptors: Alpha, Beam, *Bombardment, Cell, Coulomb collision, Damage, *Degradation, Elementary, *Elementary particle, Energy, Flux, Illumination, Irradiation, Particle, Proton, Scattering, *Silicon, Solar, *Solar cell, Velocity.

For abstract, see S 04 13.

N66-24598 Field 10A
CFSTI Prices HC$4.00 MF$0.75
Westinghouse Electric Corp., Baltimore, Md.
INVESTIGATION OF THIN DIELECTRIC FILMS FOR ENERGY CONVERSION FINAL REPORT.
26 Jul 65, 120p NASA-CR-71744, AAD-51255
Contract NAS2-1995

Descriptors: Conversion, Cycle, Dielectric, *Dielectric material, Efficiency, Electric, Energy, *Energy conversion, Ferroelectrics, Film, Material, Plastic, Solar, *Solar energy, Switching, Thermodynamic, Thermoelectricity, Thin, *Thin film.

For abstract, see S 04 13.

N66-24698 Field 10A
CFSTI Prices HC$7.00 MF$1.75
General Electric Co., Cincinnati, Ohio.
TWO STAGE POTASSIUM TEST TURBINE QUARTERLY PROGRESS REPORT NO. 18, 8 AUG. - 8 NOV. 1965.
by E. Schnetzer. 10 Jan 66, 301p NASA-CR-54917
Contract NAS5-1143

Descriptors: Alloy, Blade, Characteristics, Contamination, Endurance, Engine, *Engine testing, Molybdenum, Niobium, Performance, *Performance characteristics, *Potassium, Stage, Table, Test, Turbine, Two, *Two-stage turbine.

For abstract, see S 04 13.

N66-24989 Field 10A
CFSTI Prices HC$3.00 MF$0.50
General Dynamics Corp., San Diego, Calif.
RADIATION EFFECTS ON SILICON SOLAR CELLS TECHNICAL SUMMARY REPORT, MAY 16 - OCT. 15, 1963.
by J. W. Harrity, D. K. Nichols, D. P. Snowden, and W. A. Van Iint. 4 Dec 63, 56p NASA-CR-74712, GA-4797
Contracts NAS7-91, PROJ. 258

Descriptors: Carrier, Cell, Effect, Electron, *Electron spin resonance, Energy, Irradiation, Lifetime, Mobility, Radiation, *Radiation effect, *Recombination, Resonance, Semiconductor, Silicon, *Silicon solar cell, Solar, Spin.

For abstract, see S 04 13.

N66-25164 Field 10A
CFSTI Prices HC$3.00 MF$0.75
American Cyanamid Co., Stamford, Conn.
DEVELOPMENT OF HIGH-PERFORMANCE LIGHT-WEIGHT ELECTRODES FOR HYDROGEN-OXYGEN FUEL CELLS THIRD QUARTERLY REPORT, 6 OCT. 1965 - 5 JAN. 1966.
by W. P. Colman, J. Di palma, and D. Gershberg. 15 May 66, 73p NASA-CR-54955
Contract NAS3-6477

Descriptors: Cell, Cerium, Concentration, *Electrode, Fuel, *Fuel cell, High performance, *Hydrogen, Hydroxide, Initial, Lightweight, Oxide, *Oxygen, Performance, Polytetrafluoroethylene, Potassium, Pressure, Temperature, Voltage.

For abstract, see S 04 13.

N66-25542 Field 10A
CFSTI Prices HC$6.00 MF$1.50
Hamilton Standard Div., United Aircraft Corp., Broad Brook, Conn.
NONDISSIPATIVE DC TO DC REGULATOR-CONVERTER STUDY, PHASE I FINAL PROJECT REPORT, 15 JUN. 1964 - 31 DEC. 1965.
by F. L. Raposa. 1965, 290p NASA-CR-74945, HSER-3140
Contract NAS5-3921

Descriptors: *Booster, Breadboard, *Chopper, *Converter, Current, Direct, *Direct current (dc), Feedback, Nondissipative, Output, Power, Regulation, *Regulator, Ripple, Supply, Voltage.

For abstract, see S 04 14.

N66-26249 Field 10A
CFSTI Prices HC$2.00 MF$0.50
Electro-optical Systems, Inc., Pasadena, Calif.
HYDROGEN-OXYGEN ELECTROLYTIC REGENERATIVE FUEL CELLS, APRIL 1 - MAY 1, 1966.
by E. Findl, and M. G. Klein. 10 May 65, 29p NASA-CR-75096, EOS-4110-ML-25
Contract NAS3-2781

Descriptors: Asbestos, Cell, Characteristics, *Electrode, Evaluation, Fuel, *Hydrogen, Material, *Matrix, Multiple, *Oxygen, Performance, *Performance characteristics, Potassium, Regeneration, *Regenerative fuel cell, Single, Titanate.

For abstract, see S 04 14.

N66-26549 Field 10A
CFSTI Prices HC$4.00 MF$1.00
Texas Instruments, Inc., Dallas.
DEVELOPMENT OF EPITAXIAL STRUCTURES FOR RADIATION RESISTANT SILICON SOLAR CELLS.
by P. Gleim. May 66, 138p NASA-CR-461
Contract NAS5-3559

Descriptors: Cell, Deposit, Diffusion, Drift, Epitaxy, Field, Radiation, *Radiation field, *Silicon, Solar, *Solar cell, Structure.

For abstract, see S 04 14.

N66-26653 Field 10A
CFSTI Prices HC$5.00 MF$1.00
Pennsylvania Univ., Philadelphia.
RESEARCH IN THE CONVERSION OF VARIOUS FORMS OF ENERGY BY UNCONVENTIONAL TECHNIQUES STATUS REPORT.
by M. Altman. 1 Apr 66, 157p NASA-CR-75115, INDEC-SR-7
Grant NSG-316

Descriptors: *Abstract, Conversion, Development, Electrochemical, Electron, *Electron emission, Emission, Energy, Engineering, *Engineering development, *Fuel cell, Gas, Heat transfer, Ionized, *Ionized gas, Nonlinear, Phenomenon, *Plasma probe, Solar, Thermal.

For abstract, see S 04 14.

N66-26753 Field 10A
CFSTI Prices HC$2.00 MF$0.50
General Electric Co., Schenectady, N. Y.
STUDY OF NICKEL-CADMIUM CELLS THIRD QUARTERLY REPORT, 17 NOV. 1965 - 17 FEB. 1966.
1966, 36p NASA-CR-75192
Contract NAS5-9586

Descriptors: *Anode, Battery, Cadmium, *Capacitance, Characteristics, Charge, Discharge, Electric, *Electric energy storage, Energy, Evolution, Gas, *Gas evolution, Hydroxide, Nickel, *Nickel-cadmium battery, Oxygen, Performance, *Performance characteristics, Storage.

For abstract, see S 04 14.

N66-26758 Field 10A
CFSTI Prices HC$2.00 MF$0.50
Matrix Research And Development Corp., Nashua, N. H.
DESIGN AND DEVELOPMENT OF A NON-DISSIPATIVE CHARGE CONTROLLER USING A ROTARY TRANSFORMER SECOND QUARTERLY REPORT.
1966, 42p NASA-CR-75198
Contract NAS5-9204

Descriptors: Breadboard, *Charge, Control, *Control device, Design, Development, Device, Dissipation, Electronic, *Electronic equipment, Equipment, Machine, Power, Rectification, Rotary, Rotating, *Rotating machine, Sensing, Synchronous, *Transformer.

For abstract, see S 04 14.

N66-26870 Field 10A
CFSTI Prices HC$2.00 MF$0.50
Leesona Corp., Great Neck, N. Y.
THE IMPROVEMENT OF ZINC ELECTRODES FOR ELECTROCHEMICAL CELLS QUARTERLY REPORT NO. 3, 5 DEC. 1965 - 4 MAR. 1966.
by C. W. Fleischmann, and J. E. Oxley. 1966, 30p NASA-CR-75237
Contract NAS5-9591

Descriptors: Activation, Cadmium, Cell, Charge, Control, Copper, Dendrite, Diffusion, Electrochemical, *Electrochemical cell, *Electrode, Electrolyte, Ion, Lead, Porosity, Pulse, Silver, *Substrate, Tin, *Zinc.

For abstract, see S 04 14.

N66-34637 Field 10A
CFSTI Prices HC$4.00 MF$1.00
Allis-chalmers Mfg. Co., Milwaukee, Wis.
OPERATING INSTRUCTIONS, ALLIS- CHALMERS FUEL CELL POWER SYSTEM (SYSTEM NUMBER 5 R).
6 Jun 66, 147p NASA-CR-77276
Prepared For Nasa

Descriptors: Cell, Diagram, Fuel, *Fuel cell, *Instruction, Instrumentation, Loop, *Manual, Open, Operation, Performance, Power,

*Power supply, Subsystem, Supply, System, Thermocouple.

For abstract, see S 04 20.

10B. POWER SOURCES

AD-485 683 **Field 10B**
CFSTI Prices: HC$5.00 MF$1.00
Honeywell, Inc., Hopkins, Minn.
GENERATOR, DIRECT CURRENT, G-54 ()/G (HAND CRANKED).
Final rept., 28 Jun 61-30 Dec 65.
by R. H. Cole. 30 Dec 65, 178p
Contract DA-36-039-sc-87331
Task 1E6-40306-D-488-07
See also AD-475 795.

Descriptors: (*Hand generators, Design), Direct current, Weight, Radio equipment, Noise, Reduction, Wattmeters, Lubrication, Electrical networks, Performance (Engineering), Suspension devices.

The development achievements of this contract may be divided into three phases: (a) analyses and research leading up to the recommendations embodied in the Design Plan, (b) design, fabrication and testing of the first and second experimental models, and (c) the design, fabrication and testing of the Development Models. In the Design Plan, both a conventional drive and a harmonic drive were recommended, and upon approval of USAECOM, were fabricated into the first experimental models. These units were evaluated and it was determined that improvements in the mounting assembly, electronic regulator and acoustic noise emission level were desired. Noise reduction, consequently, became one of the major areas of development effort. Subsequent to studies and testing of various gearing and mounting concepts, a resilient suspension system was developed that reduced the noise level to within the tolerance limits specified in SCL-4256. The design of the development models was completely defined and fabrication plans were established. The development units incorporating the harmonic drive assembly were determined to be more compatible with the program objectives than the conventional drive during testing of the experimental models. (Author)

AD-639 215 **Field 10B**
CFSTI Prices: HC$1.00 MF$0.50
Institute of Gas Technology, Chicago, Ill.
JP-4 FUELED MOLTEN CARBONATE FUEL CELLS.
Rept. no. 1, 1 Jan-1 Jul 66.
Jul 66, 24p
Contract DA-44-009-AMC-1456 (T)

Descriptors: (*Fuel cells, Carbonates), Fuels, Life expectancy, Performance (Engineering), Electrodes, Pipes, Sandwich construction, Corrosion.

Identifiers: JP-4 fuels.

Sixteen single molten carbonate fuel cells were assembled and tested. Nine of these were assembled in the alumina tube enclosures and the remaining seven were made in metal flange enclosures. The areas of the alumina tube cells are 3 and 45 sq cm, and the area of the metal flange enclosure cells is 31.7 sq cm. A summary of the conditions used in all 16 tests is given. All tests used 20% dense fiber nickel anodes and paste electrolytes.

AD-639 396 **Field 10B, 13A**
CFSTI Prices: HC$2.00 MF$0.50
Radio Corp. of America, Lancaster, Pa. Direct Energy Conversion Dept.
INVESTIGATION OF MATERIALS FOR HIGH TEMPERATURE FOSSIL FUEL HEATED BURNERS.
Interim technical rept., 1 Jul 65-15 Jun 66.
by Galen R. Frysinger. 15 Jun 66, 42p
Contract DA-44-009-AMC-1236T
ERDL-1236 (T)-1

Descriptors: (*Heaters, *Thermionic converters), High-temperature research, Pipes, Silicon compounds, Carbides, Aluminum compounds, Heat-resistant materials, Oxides, Propanes, Design, Performance (Engineering).

The effort included a materials evaluation, burner geometry design, and burner evaluation. The materials evaluation eliminated metals from consideration, and of the non metals only silicon carbide and alumina were promising. Silicon carbide was selected because of its light weight and superior resistance to thermal stress. The burner geometry investigation included tests on six designs. The resultant geometry incorporated a six-combustion-chamber unit incorporating preheating of the incoming air and partial premixing of the cold air and propane fuel. The proof test models were operated satisfactorily to temperatures in excess of 1000 C. However, particles of silicon carbide clogged the jets at this temperature and limited higher temperature operation. It was indicated that this condition can be corrected and satisfactory operation obtained at temperatures up to 1750 C. (Author)

AD-639 488 **Field 10B**
CFSTI Prices: HC$2.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
PERSPECTIVES OF CREATING POWERFUL MAGNETOHYDRODYNAMIC GENERATORS.
by Ye. Ya. Kazovskii, Ya. B. Danilevich, and V. N. Shakhtarin. 17 Jun 66, 27p FTD-TT-65-1876 TT-66-62350
Unedited rough draft trans. of Elektrotekhnika (USSR) n9 p8-14 1964.

Descriptors: (*Magnetohydrodynamic generators, Electric power production), USSR, Industrial plants, Effectiveness.

The basic problems connected with the creation and utilization of an MGD generator are discussed. Further analyzed are the possibilities of increasing the effectiveness of MGD generators on account of 'cold' ionization methods by using ultra-conductors. (Author)

N66-24110 **Field 10B**
CFSTI Prices HC$3.00 MF$0.75
Vickers, Inc., Torrance, Calif.
DEVELOPMENT OF AUXILIARY ELECTRIC POWER SUPPLY SYSTEM MONTHLY PROGRESS REPORT, OCT. 1962.
by R. C. Thomas. 1962, 62p NASA-CR-71793, PR-91565-430-4
Contract NAS3-2550

Descriptors: Auxiliary, *Auxiliary power source, Closed, Compressor, Conversion, Design, Development, Electric, *Electric power conversion, Engine, Engineering, Heat transfer, Hydrox, *Hydrox engine, Loop, Power, Source.

For abstract, see S 04 13.

N66-24641 **Field 10B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TWO LEVEL VOLTAGE LIMITER.
by R. Morrison, and N. Potter. Jan 66, 22p NASA-TM-X-55446, X-716-66-7

Descriptors: Battery, Cadmium, Charge, Circuit, Control, *Control device, Device, Limiter, Overcharge, Pressure, Regulator, Rise, Silver, *Silver-cadmium battery, Voltage, *Voltage regulator.

For abstract, see S 04 13.

N66-25017 **Field 10B**
CFSTI Prices HC$5.00 MF$1.00
Manson (S. V.) And Co., Inc., Arlington, Va.
A STUDY OF FINNED TUBE GAS-TO-LIQUID HEAT EXCHANGERS FOR BRAYTON CYCLES IN SPACE.
by S. V. Manson. Apr 66, 162p NASA-CR-459
Contract NAS3-2535

Descriptors: Argon, *Brayton cycle, Coolant, Cooling, Engine, Exchanger, Fin, Flow, Gas, Heat, *Heat exchanger, Heat transfer, Liquid, *Liquid cooling, Lithium, Neon, Plant, Potassium, Power, *Power plant, Sodium, Tube.

For abstract, see S 04 13.

N66-26553 **Field 10B**
CFSTI Prices HC$3.00 MF$0.50
National Aeronautics And Space Administration, Lewis Research Center, Cleveland, Ohio.
MATHEMATICAL MODEL WITH EXPERIMENTAL VERIFICATION FOR THE DYNAMIC BEHAVIOR OF A SINGLE-TUBE CONDENSER.
by A. A. Schoenberg. Jun 66, 53p NASA-TN-D-3453

Descriptors: Condensation, *Condenser, Equation, Flow, Fluid, Frequency, Function, Heat, Interface, *Mathematical model, Mathematics, Model, Power, Pressure, *Rankine cycle, Response, Transfer, Working, *Working fluid.

For abstract, see S 04 14.

N66-26747 **Field 10B**
CFSTI Prices HC$2.00 MF$0.50
Vickers, Inc., Torrance, Calif.
DEVELOPMENT OF A HYDROGEN-OXYGEN SPACE POWER SUPPLY SYSTEM.
by W. D. Morath. 1966, 30p NASA-CR-75177, PR-91570-510-12
Contract NAS3-2787

Descriptors: *Engine design, *Failure, Fuel, Hydrogen, Injector, Oxygen, Power, *Power supply, Prototype, Spacecraft, Supply, Valve.

For abstract, see S 04 14.

N66-34427 **Field 10B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Lewis Research Center, Cleveland, Ohio.
CONTROL AND STARTUP CONSIDERATIONS FOR TWO-SPOOL SOLAR- BRAYTON POWER SYSTEM.
by H. G. Hurrell, and R. L. Thomas. Aug 66, 19p NASA-TM-X-1270
Contract 123-33-04-03-22

Descriptors: Analog, Argon, *Brayton cycle, Computer, *Computer simulation, Control, Earth, *Earth orbit, Ecliptic, Generator, Heat, Orbit, Power, *Power generator, Simulation, Solar, *Solar power system, Storage, System, Turbine.

For abstract, see S 04 20.

N66-35046 **Field 10B**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration, Lewis Research Center, Cleveland, Ohio.
ANALOG COMPUTER STUDY OF TEMPERATURE GRADIENTS OF A SOLAR COLLECTOR IN ECLIPTIC EARTH ORBIT.
by R. L. Thomas. Sep 66, 31p NASA-TM-X-1282
Contract 123-33-04-03-22

Descriptors: Analog, *Analog simulation, Analysis, Collector, Computer, Distortion, Distribution, *Earth orbit, Ecliptic, Gradient, Magnesium, Mirror, Parabolic, Program, Radial, Rib, Section, Simulation, Solar, *Solar

collector, Support, Surface, *Surface distortion, Temperature, *Temperature gradient.

For abstract, see S 04 20.

N66-35215 Field 10B
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
COMPARISON OF LIQUID-METAL MAGNETOHYDRODYNAMIC POWER CONVERSION CYCLES.
by L. G. Hay, and E. Weinberg. 15 Aug 66, 38p NASA-CR-77551, JPL-TR-32-946
Contract NAS7-100

Descriptors: Area, Cesium, Comparison, Condenser, Conversion, Cycle, Efficiency, Energy, *Energy conversion, Jet, Liquid, *Liquid metal, Lithium, *Magnetohydrodynamics, Metal, Potassium, Power, *Power conversion, Radiator, Separator, Weight.

For abstract, see S 04 20.

AD-638 758 See Field 9C

AD-638 786 See Field 8F

10C. ENERGY STORAGE

AD-475 526 Field 10C
CFSTI Prices: HC$4.00 MF$0.75
Edison (Thomas A.) Industries, Bloomfield, N. J. Primary Battery Div.
AUXILIARY ELECTRODE FOR CHARGE CONTROL OF SEALED NICKEL-CADMIUM BATTERIES.
Quarterly progress rept. no. 5, 15 Jun-14 Sep 65.
by Philip F. Grieger. 14 Sep 65, 113p
Contract DA-28-043-AMC-00152 (E)
Proj. DA-1C6-22001-A-053-02
See also AD-469 278.

Descriptors: (*Batteries + components, Primary cells), (*Electrodes, Cadmium), (*Nickel, Electrodes), Operation, Temperature, Voltage, Hydrogen, Production, Polarization, Oxygen, Reduction (Chemistry), Construction, Optimization, Statistical analysis, Performance (Engineering), Hermetic seals, Electric discharges, Platinum, Electrolytes, Potassium compounds, Hydroxides, Alkaline cells.

Eighteen cells (and one replicate) have been tested in the main experiment which calls for two auxiliary positions and three quantities of electrolyte as levels of construction factors, and three rates (C/10, 1C, 5C) and three temperatures (0 F, room, 120 F) as levels of testing factors. At room temperature and 120 F signaling voltage response to pressure is generally good. At 0 F massive H2 evolution occurs on the cadmium electrode thereby causing heavy polarization of the O2-reduction electrode; as a result signaling is adversely affected and may fail to respond to O2. Statistical analysis confirms the conclusion that Side/Semi-dry is the best construction. (Author)

AD-638 870 Field 10C
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
DISCHARGE MONITORING MEDIA AND SYSTEM OF AUTOMATIC CHARGING OF ALKALI STORAGE BATTERIES.
by S. V. Malevanaya, and Yu. I. Plotnikov. 13 Jun 66, 8p FTD-TT-65-1896
66-62223
Unedited rough draft trans. of Byulleten Tekhniko-Ekonomicheskoi Informatsii (USSR), n8 p18-20 1961.

Descriptors: (*Storage batteries, Maintenance), Electric discharges, Monitors, Maintenance equipment, USSR.

The means for the monitoring of the discharging and charging of the storage batteries consists of a plug-in automatic device, the ShA-1, with a maximum current protection and a counter of ampere hours. The plug-in automatic device represents a two-chamber explosion-proof body in one of the chambers on which there is mounted a two-pole automatic unit, and in the other a counter of electrical energy. As the counter, there is used a mercury indicator of the energy received by the battery (in ampere-hours) in the charging and the amount of it leaving the battery in the discharging. The system of the automatic charging of the battery (see drawing) consists of a relay of voltage and current and a blocking relay, the two of which in the assembly with the counter of electric energy, assure the automatic cutting in on charging and cutting out on finishing the discharging.

AD-638 888 Field 10C, 7D
CFSTI Prices: HC$7.30 MF$2.00
Foreign Technology Div., Wright-Patterson AFB, Ohio.
CHEMICAL CURRENT SOURCES.
by M. A. Dasoyan. 18 Apr 66, 428p FTD-TT-66-7
TT-66-62235
Unedited rough draft trans. of mono. Khimicheskie Istochniki Toka, Moscow/Leningrad, 1961 350p.

Descriptors: (*Storage batteries, Textbooks), (*Batteries + components, Textbooks), Dry cells, Wet cells, Electrochemistry, Theory, Electric currents, Manganese, Oxygen, Zinc, Mercury, Lead, Silver, Copper, Magnesium, Nickel, Cadmium, Iron, Alkaline cells, Battery components, Electrodes, Antimony, Electrolytes, USSR.

The book gives basic information on the most important forms of chemical current sources. The variety of alkali and lead storage batteries and voltaic elements produced industrially is discussed, together with their electrical and service characteristics. Recommendations are made as to the choice of storage batteries for various operating conditions. The properties of the materials employed in the manufacture of chemical current sources are described. Safety techniques employed in working with storage batteries are considered. The book is designed for engineers and technicians concerned with the production or operation of chemical current sources. (Author)

AD-639 302 Field 10C, 21C
CFSTI Prices: HC$4.00 MF$1.00
Allison Div., General Motors Corp., Indianapolis, Ind.
LITHIUM-CHLORINE ELECTROCHEMICAL ENERGY STORAGE SYSTEM.
Interim technical rept., 13 Dec 65-13 Jun 66.
by Earl H. Hietbrink. 5 Jul 66, 132p EDR-4669
Contract DA-44-009-AMC-1426 (T)

Descriptors: (*Storage batteries, *Electric propulsion), Vehicles, Lithium, Chlorine, Electrodes, Maintenance, Power supplies, Feasibility studies, Performance (Engineering).

The objective of the program is to obtain suitable laboratory data to determine the feasibility of a lithium-chlorine electrically rechargeable electrochemical energy storage system for vehicle propulsion. Various methods for increasing the electrochemical charge rate were investigated. At high charging current densities, the cell efficiency was found to drop significantly due to polarization of the Cl2 electrode. Experimental investigations determined that both geometry and material selection are important in the electrode design and that reverse pulsing enhances the electrode performance, allowing higher charging current density. A laboratory test cell using Li and Cl2 as reactants was fabricated to evaluate methods for increasing the electrochemical charge rate. An electrical short terminated the first cell test before meaningful data could be obtained. The required design modifications to eliminate this problem are being incorporated into the design. System analytical studies were conducted on two cell concepts. The first was an advanced concept of the Mark IV experimental cell currently being tested. The second was a cylindrical cell design using vertical electrodes. The latter cell was selected as the most advantageous and was developed into a replaceable ten-module engine system to meet the ERDL duty cycle requirements. The system is estimated to weigh 1250 lb and provide 200 kw-hr of energy. System analysis and trade-off studies on a fast charge system concept are in progress. Experimental investigations were initiated to determine the feasibility of Cl2 adsorption on charcoal. (Author)

AD-639 609 Field 10C, 21C
CFSTI Prices: HC$3.00 MF$0.75
Leesona Moos Labs. Div., Leesona Corp., Great Neck, N. Y.
ZINC/AIR HIGH ENERGY DENSITY RECHARGEABLE ENERGY STORAGE SYSTEM.
Interim rept. 6 Jan-6 May 66.
by M. A. Vertes, E. G. Katsoulis, J. E. Oxley, and K. Alfredson. Aug 66, 57p
Contract DA-44-009-AMC-1469 (T)

Descriptors: (*Storage batteries, Design), (*Electrodes, *Zinc), Air, Electrolytes, Batteries + components, Vehicles, Electric propulsion.

Identifiers: Zinc-air cells.

Electrically rechargeable Zn/Air energy storage systems were investigated. Two alternative systems, one with static and one with recirculating electrolyte, were studied. The ability of both systems to sustain charge/discharge cycling was shown experimentally. Parallel analytical studies showed that the static electrolyte system would be less complex and lighter in weight. For example, this latter system would yield, at the 4 hour charge-10 hour discharge cycle, 80 wh/lb energy density and an energy storage efficiency of 52%. Conceptual designs for nominal 10 KWH units are presented. (Author)

N66-24382 Field 10C
CFSTI Prices HC$3.00 MF$0.75
General Electric Co., Gainesville, Fla.
DEVELOPMENT OF IMPROVED CADMIUM ELECTRODES FOR SEALED SECONDARY BATTERIES INTERIM REPORT NO. 1.
by H. H. Kroger. 30 Mar 66, 92p NASA-CR-54937
Contract NAS3-7636

Descriptors: Battery, Cadmium, Capacity, Cell, Development, *Electrochemical cell, Electrochemistry, *Electrode, Fiber, Impregnation, Improvement, *Nickel, *Nickel-cadmium battery, Sealing, Secondary.

For abstract, see S 04 13.

N66-24926 Field 10C
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
USE OF THE ADSORPTION HYDROGEN ELECTRODE AND THE OXYGEN FUEL-CELL ELECTRODE IN NICKEL- CADMIUM CELLS.
by K. O. Sizemore. Apr 66, 30p NASA-TM-X-55469, X-716-66-83

Descriptors: Absorption, Battery, Cadmium, Cell, Characteristics, Electrochemical, *Electrochemical cell, *Electrode, Fuel, Gas, *Hydrogen, Linear, Nickel, *Nickel-cadmium battery, *Oxygen, Pressure, Recombination, Response.

For abstract, see S 04 13.

N66-24928 Field 10C
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AUXILIARY ELECTRODE INSTRUMENTATION FOR NICKEL CADMIUM CELLS.

by T. J. Hennigan, and K. O. Sizemore. May 66, 26p NASA-TM-X-55471, X-716-66-200
Presented At Power Sources Conf., 24-26 May 1966, Sponsored By Army

Descriptors: Auxiliary, Battery, Cadmium, Cell, *Charge, Control, Discharge, Effect, *Electrode, Memory, Nickel, *Nickel-cadmium battery, Solid, State, System, Threshold.

For abstract, see S 04 13.

N66-24963 **Field 10C**
CFSTI Prices HC$2.00 MF$0.50
Marine Engineering Lab., Annapolis Md.
SHUNT VOLTAGE REGULATOR CIRCUIT FOR NICKEL- CADMIUM CELLS WITH AUXILIARY ELECTRODES.
by F. E. Ford, and P. M. Liwski. Apr 66, 42p NASA-CR-74787, MEL-93/66
NASA ORDER S-12730-G

Descriptors: Battery, Breaker, Cadmium, Cell, Charge, Circuit, *Circuit breaker, Control, Current, Detector, Diode, Electrochemical, *Electrochemical cell, Electrode, Nickel, *Nickel-cadmium battery, Power, Regulator, Satellite, *Shunt, Voltage.

For abstract, see S 04 13.

N66-24976 **Field 10C**
CFSTI Prices HC$2.00 MF$0.50
Unified Science Associates, Inc., Pasadena, Calif.
GASEOUS ELECTROLYTES FOR BATTERIES AND FUEL CELLS SIXTH QUARTERLY REPORT, 21 NOV. 1965 - 20 FEB. 1966.
by S. Naiditch. 1966, 46p NASA-CR-74671
Contract NAS7-326

Descriptors: Battery, Cell, Characteristics, *Conductivity, Current, Electrochemical, *Electrochemical cell, *Electrolyte, Fuel, Gaseous, Solution, Specific, Storage, Voltage.

For abstract, see S 04 13.

N66-25021 **Field 10C**
CFSTI Prices HC$2.00 MF$0.50
Radio Corp. Of America, Princeton, N. J.
CORRELATION OF DATA FROM TESTS ON NICKEL- CADMIUM BATTERIES FINAL REPORT.
by I. M. Schulman. May 66, 43p NASA-CR-480
Contract NASW-1001

Descriptors: Analysis, Battery, Cadmium, Cell, Computer, *Computer method, Data, Expectancy, Fortran, Life, Method, Model, Nickel, *Nickel-cadmium battery, Prediction, Procedure, Program, Statistical, *Statistical analysis, Test.

For abstract, see S 04 13.

N66-25063 **Field 10C**
CFSTI Prices HC$4.00 MF$1.00
Globe-union, Inc., Milwaukee, Wis.
A PROGRAM TO DEVELOP A HIGH-ENERGY DENSITY PRIMARY BATTERY WITH A MINIMUM OF 200 WATT HOURS PER POUND OF TOTAL BATTERY WEIGHT SEVENTH QUARTERLY REPORT, JAN. 1 - MAR. 31, 1966.
by W. E. Elliott, J. R. Huff, J. L. Jamrozy, G. D. Mc donald, and G. L. Simmons. 15 Apr 66, 127p NASA-CR-54928
Contract NAS3-6015

Descriptors: Anode, Battery, *Cathode, Density, Device, Electrode, Energy, *Energy storage device, High energy, Hydroxide, Lithium, Material, Nickel, Organic, Oxide, Reaction, Silver, Storage, *Storage battery.

For abstract, see S 04 13.

N66-26234 **Field 10C**
CFSTI Prices HC$2.00 MF$0.50
Atomics International, Canoga Park, Calif. Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
RADIATION EFFECTS ON SILVER AND ZINC BATTERY ELECTRODES, III INTERIM REPORT, OCT. 1965 - JAN. 1966.
by W. A. Mc collum, M. M. Nicholson, H. L. Recht, and G. Schlesinger. 21 Mar 66, 27p
NASA-CR-74905, AI-66-33
Contracts NAS7-100, JPL-951109
Prepared For Jpl

Descriptors: Battery, Capacity, Current, Density, Discharge, Effect, *Electrode, Evolution, Gamma, Gas, Radiation, *Radiation effect, Silver, *Silver-zinc battery, Zinc.

For abstract, see S 04 14.

N66-26274 **Field 10C**
CFSTI Prices HC$3.00 MF$0.50
Gulton Industries, Inc., Metuchen, N. J.
INVESTIGATION OF BATTERY ACTIVE NICKEL OXIDES THIRD QUARTERLY REPORT.
by S. Lerner, P. Ritterman, and H. Seiger. 12 Mar 66, 58p NASA-CR-54957
Contract NAS3-7620

Descriptors: *Battery, Cobalt, Diffraction, *Electrode, Nickel, *Nickel oxide, Oxide, Pattern, Structure, Temperature, X-ray, *X-ray diffraction.

For abstract, see S 04 14.

N66-35218 **Field 10C**
CFSTI Prices HC$3.75 MF$1.50
Mallory (P. R.) And Co., Inc., Burlington, Mass.
RESEARCH AND DEVELOPMENT OF A HIGH CAPACITY, NONAQUEOUS SECONDARY BATTERY FINAL REPORT, OCT. 1964 - DEC. 1965.
by K. R. Hill, M. L. Rao, and R. G. Selim. 14 Feb 65, 235p NASA-CR-54969
Contract NAS3-6017

Descriptors: Anode, *Battery, Cathode, Cell, Chloride, Compound, Copper, Cycling, Design, Electrochemical, *Electrochemistry, Electrode, Electrolyte, Fluoride, High energy, Lithium, Salt, Secondary, Silver, Solvent.

For abstract, see S 04 20.

AD-639 489 **See Field 13J**

11A. ADHESIVES AND SEALS

AD-638 972 **Field 11A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
OPERATION OF CASCADE CONTACT SEALS.
by A. M. Evtushenko. 31 Aug 66, 25p FTD-HT-66-281
TT-66-62243
Unedited rough draft trans. of Vsesoyuznyi Nauchno-Issledovatelskii Institut Zheleznodorozhnogo Transporta. Trudy (USSR), n282 p123-42 1964.

Descriptors: (*Seals, Cascade structures), USSR, Operation, Performance (Engineering), Leakage (Fluid), Equations of motion, fluid flow, Pressure.

N66-34309 **Field 11A**
CFSTI Prices HC$6.07 MF$2.75
Marquardt Corp., Van Nuys, Calif.
APOLLO SERVICE MODULE REACTION CONTROL SYSTEM ENGINE INJECTOR/CHAMBER SEAL STUDY FINAL REPORT, 12 JUL. 1965 - 12 MAY 1966.
by J. Puntar. Jun 66, 558p NASA-CR-65453, PR 3008-F
Contract NAS9-4775

Descriptors: Apollo project, Chamber, Combustion, *Combustion chamber, Control, Engine, Fuel, *Fuel injection, Graph, Head, Injection, Injector, Module, Photograph, Property, Reaction, Requirement, Resistance, Seal, *Sealing, Service, System, Table, Thermal, *Thermal property.

For abstract, see S 04 20.

11B. CERAMICS, REFRACTORIES, AND GLASSES

AD-638 753 **Field 11B, 11D, 7B**
CFSTI Prices: HC$1.00 MF$0.50
Naval Applied Science Lab., Brooklyn, N. Y.
PHOSPHORUS COMPOUNDS ON SILICEOUS GLASS SURFACES: NATURE OF HYDROLYTIC STABILITY AND EFFECT ON RESIN INTERFACE.
Final progress rept.
by Malcolm E. Schrader, Irving Lerner, and Leo Deutsch. 25 Aug 66, 25p Rept. no. 5319-44-Final
Proj. SF-020-04-01
Task 1008

Descriptors: (*Composite materials, Finishes + finishing), (*Glass, Finishes + finishing), (*Glass textiles, Finishes + finishing), (*Phosphorus compounds, Films), Organic phosphorus compounds, Chemical reactions, Tracer studies, Solubility, Chemisorption, Chemical bonds, Composite materials, Laminated plastics.

Radioactive diethyl phosphite deposited from solution on glass disks or cloth formed a three component film according to the following classification: (1) water soluble at 25C, (2) water insoluble at 25C, (3) water insoluble at 100C. (1) is interpreted as physically adsorbed, (2) as chemisorbed through one surface Si-O-P link per molecule, and (3) as chemisorbed through multiple source Si-O-P links per molecule. Evidence indicates that (1) participates in increasing the dry strength of epoxy laminates. (Author)

AD-638 884 **Field 11B, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
USE OF THE ELECTROMAGNETIC METHOD FOR INVESTIGATING RESIDUAL THERMAL STRESSES IN CERAMICS.
by V. N. Rudakov. 13 Jun 66, 14p FTD-TT-65-1965
TT-66-62234
Unedited rough draft trans. of mono. Nauchnoye Soveshchaniye po Teplovym Napryazheniyam v Elementakh (no. 4) Konstruktsii, Kiev n.d. p314-22.

Descriptors: (*Ceramic materials, Thermal stresses), USSR, Polariscopes, Non-destructive testing.

AD-639 226 **Field 11B, 11G, 13I**
CFSTI Prices: HC$2.00 MF$0.50
Army Electronics Command, Fort Monmouth, N. J.
PROPERTIES OF ULTRAFINE GRAINED BaTi03 SUPER-PRESSED AT LOW TEMPERATURES.
Technical rept.
by R. J. Brandmayr. Aug 66, 30p ECOM-2719
Proj. DA-1C0-24401-A-348
Task 1C0-24401-A-348-33

Descriptors: (*Ceramic materials, Compacting), (*Barium compounds, Titanates), Ferroelectric materials, Dielectrics, Hot working, Grain size, Dielectric properties, Microstructure, X-ray diffraction analysis.

Identifiers: Barium titanate.

High purity, ultra-fine-grained BaTi03 powder has been densified by 'squeezing' in a hexahedral press at pressures of 50 kilobars and temperatures in the range of 125 to 720 C. X-ray diffraction patterns of the pressed material indicate that strain and/or particle reduction have resulted from application of the pressure. Electrical data show that a wide range of dielectric constants were obtained for these bodies, depending on the pressing temperatures. The bodies showed a high degree of temperature stability of dielectric constant due to complete suppression of the curie temperature. Samples having an ultra-fine grained (0.05 microns), uniform microstructure have been obtained. (Author)

NBS-BSS-6 **Field 11B, 13C**
CFSTI Prices: HC$0.20 MF$0.50
National Bureau of Standards, Washington, D. C. Building Research Div.
SOME PROPERTIES OF THE CALCIUM ALUMINOFERRITE HYDRATES.
Building science series.
by Elmer T. Carlson. 1 Jun 66, 17p
Also available from Superintendent of Documents, GPO, Washington, D. C. 20402, HC $0.20, as C 13.29/2:6.

Descriptors: (*Cements, Materials), (*Calcium compounds, Physical properties), (*Aluminum compounds, Physical properties), (*Ferrites, Physical properties), Hydrates, Crystal structure, X-ray diffraction analysis, Differential thermal analysis, Stability, Sulfates, Chemical reactions, Phase studies.

Identifiers: Calcium aluminoferrites.

Calcium aluminoferrite hydrates in two series, 4CaO. (Al2O3FeO3).nH2O (hexagonal plates) and 3CaO. (Al2O3Fe2O3).6H2O (isometric), were prepared from the anhydrous aluminoferrites by hydration in the presence of Ca (OH)2. The hexgonal phase was stable below 15C, the isometric above 35C, in contact with solution. The end member, 2CaO.Fe2O3, did not produce an isometric hydrate, however. X-ray diffraction patterns of the hexagonal series in the 19H2O stage of hydration were indistinguishable from patterns of 4CaO.Al2O3.19H2O. After drying to the 13-hydrate stage, slight differences in the patterns were observed. The isometric series shows a definite shift in x-ray pattern with change in Fe2O3/Al2O3 ratio, the unit-cell edge increasing from 12.573 for 3CaO.Al2O3.6H2O to 12.716 for the member having Fe2O3/Al2O3 close to 5. DTA traces show endotherms near 100 and 200C representing the first dehydration stages of the isometric phase. The hexagonal hydrates are converted to the isometric during the course of the DTA run. The peak attributed to the isometric phase shifts from 323 to 290C going from the pure aluminate to the member riches in Fe2O3. All the aluminoferrite hydrates, both hexagonal and isometric, reacted with CaSOs solution to give products of the monosulfate and trisulfate (ettringite) types, the latter predominating at later stages. The rate of reaction decreased with increasing Fe2O3 content. (Author)

N66-24916 **Field 11B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
NATURE OF THE MG O AND AL2 O3 CONDUCTIVITY.
Kharakter Provodimosti Mgo I Al203
by A. G. Frolov, V. P. Luzgin, D. S. Rutman, L. V. Vinogradova, and A. F. Vishkarev. Apr 66, 12p NASA-TT-F-10093
Transl. Into English From Ogneupory (Moscow), V. 30, No. 4, 1965 P 42-44

Descriptors: Aluminum, *Aluminum oxide, Conduction, Conductivity, Corundum, Dielectric, Electric, *Electric conductivity, Electrolyte, Electron, High temperature, Ion, Magnesium, *Magnesium oxide, Material, Oxide, Solid.

For abstract, see S 04 13.

N66-35207 **Field 11B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
FRICTION CHARACTERISTICS OF SINGLE CRYSTAL AND POLYCRYSTALLINE ALUMINUM OXIDE IN CONTACT IN VACUUM.
by D. H. Buckley. Sep 66, 15p NASA-TN-D-3599
Contract 123-03-13-02-22

Descriptors: *Adhesion, Aluminum, *Aluminum oxide, Ceramic, Contact, Crystal, Deformation, *Friction, Material, Oxide, Plastic, Polycrystal, Property, *Sapphire, Single, Sliding, *Sliding contact, Vacuum.

For abstract, see S 04 20.

PB-172 457 **Field 11B**
CFSTI Prices: HC$8.60 MF$0.75
Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
AN INVESTIGATION OF THE THEORETICAL AND PRACTICAL ASPECTS OF THE THERMAL EXPANSION OF CERAMIC MATERIALS.
Summary rept.
30 Sep 60, 81p PI-1273-M-8
Contract NOrd-18419
AD-250 663

Descriptors: (*Ceramic materials, *Thermal expansion), Alkali metal compounds, Halides, Crystal lattices, Solid solutions, Phase studies.

Prediction of the thermal expansion coefficient of pure single phase ceramics was attempted by several methods including the openness concept and its application in homologous series and the calculation of each mode of lattice vibration in alkali halide crystals (these calculations are not yet complete). Seven materials predicted to have low coefficients were synthesized, tested and found to have low values. The work was extended to include prediction of the thermal expansion coefficient of two-phase bodies using Turner's method. To verify the results of these predictions, several phases were synthesized and measured and the thermal expansion coefficients of three different two-phase systems were investigated. A preliminary investigation resulted in some understanding of the effect of solid solution atoms on the thermal expansion anisotropy of anisotropic crystals. (Author)

PB-173 092 **Field 11B, 13B**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Reclamation, Denver, Colo.
EFFECTS OF FALSE SET IN PORTLAND CEMENT ON PROPERTIES OF CONCRETE.
by J. T. Dikeou. 30 Jun 66, 29p C-1192

Descriptors: (*Cements, Drying), Ceramic materials, Concrete, Mechanical properties, Civil engineering.

The investigation correlates false set in cements with properties of fresh and hardened concrete. Tests were conducted using 6 cements which were free of false set, heating portions of them to induce false set, and making comparative paste, mortar, and concrete mixes with both the false-setting and false-set free portions. False set by itself did not adversely affect compressive strength, drying shrinkage, or freeze-thaw durability. Dispelling false set by 'overwatering' the concrete had harmful effects. (Author)

AD-638 857 **See Field 20A**

AD-638 858 **See Field 20A**

PB-170 645 **See Field 18J**

PB-170 652 **See Field 18J**

11C. COATINGS, COLORANTS, AND FINISHES

AD-639 439 **Field 11C, 11I**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
COVERING OF METAL WITH A PLASTIC LAYER.
by Sh. Shleimovich, and I. Trakhtenberg. 7 Jun 66, 10p FTD-TT-65-1878
TT-66-62338
Unedited rough draft trans. of Rechnoi Transport (USSR), v23 n10 p29-30 1964.

Descriptors: (*Plastic coatings, Processing), Powders, Ships, Railroad cars, Machines, Finishes + finishing, Pigments, Reviews.

A description is given of experiments in applying polymeric coatings to metals undertaken at the Moscow ship-building and ship-repair plant, at the Kalinin and Leningrad railroad car construction plant and at the Kiev commercial machine construction plant.

N66-24872 **Field 11C, 18H**
CFSTI Prices HC$2.00 MF$0.50
Osterreichische Studiengesellschaft Fur Atomenergie G.m.b.h., Seibersdorf (Austria).
MEASUREMENT OF SURFACE CONTAMINATION OF EMULSIFIED PARTICLES BY FISSIONABLE MATERIAL.
Messung Der Oberflachenverunreinigun g Von Beschichteten Teilchen Durch Spaltbares Material
by K. H. Buchner, and P. Koss. 1966, 29p
SGAE-M-4/1966
In German Submitted For Publication

Descriptors: Carbon, Coating, Element, Fission, *Fission product, Fuel, *Fuel element, Gamma, Graphite, Impurity, Measurement, Nuclear, Product, Pyrolysis, *Pyrolytic graphite, Radiation, Sphere.

For abstract, see S 04 13.

N66-26168 **Field 11C**
CFSTI Prices HC$1.00 MF$0.50
Chalmers Univ. Of Technology, Goteborg (Sweden).
ON THE SURFACE ACTIVITY OF SOLID BODIES.
Uber Die Aktivitat Der Oberflachen Fester Korper
by J. A. Hedvall. 1965, 13p
In German Its Trans. No. 304

Descriptors: Absorption, Activity, Body, Chemical, Coating, *Crystallography, Effect, Grid, Interaction, Light, Magnet, Metal, Oxide, *Photochemistry, Physical, Solid, *Solid surface, Structure, Surface, *Surface chemistry, Thermal, Ultrasonic, Wave.

For abstract, see S 04 14.

N66-35172 **Field 11C**
CFSTI Prices HC$2.00 MF$0.50
Iit Research Inst., Chicago, Ill.
DEVELOPMENT OF SPACE-STABLE THERMAL-CONTROL COATINGS TRIANNUAL REPORT, JAN. 20 - JUN. 20, 1966.
by G. A. Zerlaut. 11 Jul 66, 41p NASA-CR-77438, IITRI-U6002-42
Contracts NAS8-5379, 933-50-01-0000

Descriptors: Calcium, Coating, Compound, Control, Double, Inorganic, *Inorganic coating, Magnesium, Methyl, Oxide, *Paint, Pigment, Potassium, *Potassium silicate, Reflection, Silicate, *Silicone, Simulation, Space, Stability, Testing, Thermal, *Thermal instability, Zinc, *Zinc oxide, Zirconium, *Zirconium compound.

For abstract, see S 04 20.

PB-172 421 **Field 11C, 11L**
CFSTI Prices: HC$1.00 MF$0.50
Forest Products Lab., Madison, Wis.
WOOD FINISHING: PAINTING OUTSIDE WOOD SURFACES.
Research note.
Jun 66, 3p FPL-0123

Descriptors: (*Wood, *Protective treatments), Paints, Moistureproofing.

AD-639 153 **See Field 13H**

AD-639 322 **See Field 19F**

11D. COMPOSITE MATERIALS

AD-638 921 **Field 11D, 11I, 20K**
CFSTI Prices: HC$5.00 MF$1.00
Narmco Research and Development Div., Whittaker Corp. San Diego, Calif.
MICROMECHANICS - FAILURE MECHANISM STUDIES.
Final technical rept., 15 Apr 65-15 Apr 66.
by Victor G. Grinius. Aug 66, 177p
Contract AF 33 (615)-1660
AFML-TR-66-177

Descriptors: (*Failure (Mechanics), *Composite materials), Fracture (Mechanics), Plastics, Reinforcing materials, Glass textiles, Laminates, Epoxy plastics, Fatigue (Mechanics), Boron, Metallic textiles, Loading (Mechanics).

The objective of the program was to investigate the micromechanical behavior of a fiber reinforced composite under static tension, bending, shear loading, and also under fatigue loading. The approach used for the investigation was both analytical and experimental. Material models and composite specimens including various material combinations were observed under load, evaluated photoelastically, and tested to destruction. The reasons for fracture initiation and the mode of fracture propagation are suggested. The degree of correlation between analysis and experiments is determined. (Author)

AD-638 922 **Field 11D, 11I**
CFSTI Prices: HC$5.00 MF$1.00
Aeronutronic Div., Philco Corp., Newport Beach, Calif.
EFFECT OF CONSTITUENT MATERIAL PROPERTIES ON THE STRENGTH OF FIBER-REINFORCED COMPOSITE MATERIALS.
Annual rept., Jan 65-Jan 66.
by Stephen W. Tsai, Donald F. Adams, and Douglas R. Doner. Aug 66, 180p U-3592
Contract AF 33 (615)-2180
AFML-TR-66-190

Descriptors: (*Composite materials, Mechanical properties), (*Reinforcing materials, Composite materials), Mathematical prediction, Deformation, Flexural strength, Boron, Fiber metallurgy, Epoxy plastics, Loading (Mechanics).

The investigation is concerned with the theoretical prediction of the contribution of the constituent material properties to the macroscopic principal moduli and strengths of a unidirectional fiber reinforced composite. The theoretical results obtained for the prediction of the stiffness and strength have been compared with experimental data obtained using boron-epoxy and glass-epoxy composites.

AD-639 356 **Field 11D, 9A, 13J, 11I K**
CFSTI Prices: HC$2.00 MF$0.50
Union Carbide Corp., Bound Brook, N. J. Plastics Div.
COMPOSITE THERMOPLASTIC/GLASS FILAMENT REINFORCEMENT FOR BUOYANT SUBMARINE CABLES RG-372 (XN-1)/U AND RG-373 (XN-1)/U.
Interim development rept. no. 2, 10 Jun-10 Sep 66.
by P. H. Hofer, and W. H. Zager. 10 Sep 66, 43p
Contract N00-140-66-C-0403
See also AD-634 719.

Descriptors: (*Glass textiles, Composite materials), (*Composite materials, Electric cables), (*Electric cables, *Submarine antennas), Thermoplastics, Isocyanate plastics, Buoyancy, Tensile properties, Impregnation, Reinforcing materials, Flexural strength, Coatings, Wear resistance.

Conclusions: (1) Polymers of the polyurethane family have the best property combinations of all thermoplastic resins tested to date. High strength glass/polyurethane composites can be produced which have remarkable flexibility, very good flex-life - they resist internal abrasion - coupled with outstanding abrasion resistance. (2) An 18-20% thermoplastic/80% glass weight ratio appears to be the optimum composite formula. Twenty per cent polyurethane affords good protection and distributes stresses well enough to obtain a high strength tensile member. (3) HTS-901-'S'-12 type roving gives consistently better results - higher strength, better abrasion resistance etc. - than HTS-903-'S'-12 roving. The difference between the two glasses is found in their sizing and coupling agents which are applied during manufacture. The 901 type glass roving is designed to be epoxy compatible while the 903 type is silicone compatible. (4) No additives investigated to date significantly upgrade the physical properties of glass/polyurethane composites. (5) Comparing single strand tensile data with data obtained from 5 strands which were cabled (or twisted) the strength of the cabled strands is only 80% of the mathematical strength obtained by multiplying the single strand strength five times.

AD-639 617 **Field 11D, 11I, 13H**
Not available from CFSTI.
Explosives Research and Development Establishment, Waltham Abbey (England).
WHISKER REINFORCED PLASTICS AND METALS.
by N. J. Parratt. 1965, 9p Off-print-66/5, WAC/172/039
Availability: Published in Chemical Engineering Progress v62 n3 p61-7 Mar 66.

Descriptors: (*Whiskers (Crystals , Reinforcing materials), (*Composite materials, Plastics), Great Britain, Metals, Elasticity, Ceramic fibers, Metallic crystals, Glass textiles.

Results of resin reinforcement by oriented whiskers are promising, elastic moduli exceeding 12,000,000 lb./sq. in. were obtained. Although whiskers are costly, finished composites could prove economically advantageous. (Author)

N66-34859 **Field 11D**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MECHANICAL AND PHYSICAL PROPERTIES OF THE ECHO II METAL-POLYMER LAMINATE.
by L. Kobren, and C. L. Staugaitis. Aug 66, 36p
NASA-TN-D-3409

Descriptors: Aluminum, *Balloon, Composite, Creep, *Echo ii satellite, Laminate, *Laminated material, Layer, Material, Mechanics, Metal, Multilayer, Mylar, Physics, Polymer, Property, Relaxation, Satellite, Stress, Structure, *Thin film.

For abstract, see S 04 20.

AD-638 753 **See Field 11B**

AD-638 898 **See Field 11I**

11E. FIBERS AND TEXTILES

AD-639 460 **Field 11E, 11**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
THERMAL STABILITY OF GLASS PLASTICS.
by G. A. Yakovlev. 17 Jun 66, 16p FTD-TT-65-1916
TT-66-62343
Unedited rough draft trans. of mono. Nauchnoy Soveshchanii po Teplovym Napryazheniyam v Elementakh Konstruktsii (4th) 1964 p329-38.

Descriptors: (*Composite materials, Therma stability), (*Glass textiles, Thermal stability), (*Laminated plastics, Thermal stability), Heating, Cooling, Mechanical properties, Fa tigue (Mechanics), Flexural strength, Therma stresses, USSR.

Results are presented of an investigation aime at establishing the dependence of the strength o glass-reinforced plastics on the frequency of hea ing-cooling cycles.

N66-24829 **Field 11E, 14**
CFSTI Prices HC$1.00 MF$0.50
Flying Personnel Research Committee, Londo (England).
AN APPARATUS FOR THE MEASUREMEN OF CLOTHING INSULATION.
by J. D. Nelms. Jun 64, 18p FPRC/MEMO-206

Descriptors: Air, Apparatus, *Calibration, *Clothing, Convection, Design, Emissivity, Flow, Gradient, Heat, Insulation, Perspe Radiation, Temperature, *Temperature gra dient, Thermal, *Thermal insulation.

For abstract, see S 04 13.

11F. METALLURGY AND METALLOGRAPHY

AD-473 496 **Field 11**
CFSTI Prices: HC$2.00 MF$0.50
Ship Structure Committee, Washington, D. C.
MICRO- AND MACROCRACK FORMATION.
Progress rept. no. 7.
by B. L. Averbach. Oct 65, 40p SSC-171
Proj. SR-136
Prepared in cooperation with Massachusetts Inst of Tech., Cambridge under contract NObs-88279.

Descriptors: (*Fracture (Mechanics), *Iron (*Steel, Fracture (Mechanics)), Crystal lattice defects, Single crystals, Grain boundaries, Grain structures (Metallurgy), Metallic crys tals, Transition temperature.

The formation of cleavage microcracks with a length of the order of one grain diameter is considered to be the initial step in fracture. It is assumed that the stress concentration required for cleavage is supplied by thick slip or twin bands, and the critical width of these yield bands is calculated. For example, in iron with a grain radius of 0.01 cm, the critical slip band width is 0.00002 cm, and this value is compatible with observations in the vicinity of microcracks. The second stage of crack formation involves the semicontinuous propagation of microcracks to form unstable macroscopic cracks. We postulate that plane-strain fractures occur under conditions where thick slip bands are formed in the yielded region in front of an advancing crack. Work is required to extend the initial microcracks, and this incremental work is used to calculate the crack-extension force, Gc, which is required in linear fracture mechanics. In the case of iron, the microcrack-extension force is calculated to be 5000 dynes/cm, and the minimum value of Gc is calculated to be 2,500,000 dynes/cm. This approach emphasizes the three conditions required for fracture: (1) a combination of stress and yield band width sufficient to cause local cleavage; (2) sufficient mechanical energy in the system to pro-

pagate the crack; (3) the development of a critical value of the initiation stress in order to continue crack extension. (Author)

AD-638 900 **Field 11F**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
A STATISTICAL AND METALLOGRAPHICAL STUDY OF MECHANICAL PROPERTIES OF FERRITIC MAGNESIUM CAST IRON.
by A. M. Gupta. 25 Apr 66, 11p FTD-TT-65-1823
TT-66-62239
Unedited rough draft trans. of Slevarenstvi (Czechoslovakia) v12 n8 p316-8 1964.

Descriptors: (*Iron, Castings), (*Casting alloys, Mechanical properties), Magnesium alloys, Ductility, Tensile properties, Microstructure, Metallography, Czechoslovakia, Statistical analysis.

Statistical evaluation showed that the composition of the basic cast iron is perfectly uniform and corresponds to the desired composition. That is why it is impossible to see the cause of mechanical properties fluctuation in chemical compound. The diagrams which are the results of statistical investigation showed further interested dependences: a. It appears, that to a definite tensile strength value and of the extension exist line are dependences between both values. This dependences will come into disorder if the tensile strength value will exceed a definite limit. b. In dependence upon the metal value and form of the separated graphite in the area higher than tensile strength varies ductility at a definite strength value in a considerable degree. It was established by metallographic investigations, that the microstructures of the sample are mutually clearly different. The basic metal value was formed mostly by ferrite, which contained graphite grains. If in the structure in addition to granular graphite and ferrite is present a basic amount of scaly graphite or perlite, a drop in ductility appears in comparison with the material of identical strength. Ductility is lower by the fact that the greater amount of scaly graphite and perlite in the structure occurs. The extremely very low tensile strength and very low ductility is due to the presence of a greater amount of scaly graphite in the entire area of the polishing. Graphite grains are used on the polished area only in very small number and size.

AD-638 904 **Field 11F**
CFSTI Prices: HC$2.00 MF$0.50
Naval Research Lab., Washington, D. C.
OBSERVATIONS ON MICRO-MECHANISMS OF FATIGUE CRACK PROPAGATION IN 2024 ALUMINUM.
Memo. rept.
by D. A. Meyn. Jun 66, 42p NRL-MR-1707
Proj. RRMA-02-061/652-1/R007-06-01

Descriptors: (*Aluminum alloys, Fracture (Mechanics)), (*Fractography, Aluminum alloys), Fatigue (Mechanics), Microstructure.

The propagation of fatigue cracks in 2024-T3 aluminum in air was observed to occur by two different mechanisms depending upon the crack tip stress amplitude. Propagation at low amplitudes developed striations of extreme flatness usually separated by fissures. A study of matched areas from mating fracture surfaces in the electron microscope showed that the flat and fissured sections of each striation on one fracture surface mated respectively with the flat and fissured sections on the other fracture surface. It was concluded that low amplitudes encouraged propagation by an environmentally aided mechanism, as suggested by P. J. E. Forsyth, and his basic model was adopted. Propagation at high amplitudes produced striations showing evidence of extensive local plastic deformation: isolated tear dimples were common, slip lines were well developed on the striations, and the striations were of a ridge-and-valley contour. Study of matched areas of mating fracture surfaces indicated that ridges and valleys matched ridges and valleys, respectively. A model such as proposed by McEvily, Boettner and Johnston for plastics, involving ductile tearing and compressive resharpening at the crack tip, was adopted to explain the observations made. (Author)

AD-638 926 **Field 11F**
CFSTI Prices: HC$2.00 MF$0.50
Douglas Aircraft Co., Inc., Santa Monica, Calif. Missile and Space Systems Div.
DUCTILITY LIMITATIONS OF ALUMINUM-SILICON ALLOYS.
by S. Frederick, and W. A. Bailey. 19 Aug 66, 36p DAC-59518
Contract NASA-7-101

Descriptors: (*Aluminum alloys, *Ductility), (*Silicon alloys, Ductility), (*Metallography, Aluminum alloys), Microstructure, Mechanical properties, Crystallography.

The relation between microstructure and mechanical properties of cast 356 type aluminum alloys was studied to determine the cause of the variations in properties resulting from differences in solidification rate. It was found that variations in strength are a consequence of variations in ductility and that ductility is inversely proportional to the dendrite cell size. A mechanism is proposed to account for this correlation based on the fracture strain of the interdendritic silicon particles, and the differential strain across dendrite cell boundaries. (Author)

AD-639 001 **Field 11F, 20B**
Not available from CFSTI.
Stanford Univ., Calif. Dept. of Materials Science.
DISLOCATIONS IN MARTENSITE INHERITED FROM AUSTENITE.
Revised ed.
by J. C. Shyne, and W. D. Nix. 12 Jan 65, 3p
Grant DA-ARO (D)-31-124-G68
AROD-3163:1
Revision of manuscript submitted 1 Sep 64.
Availability: Published in Acta Metallurgica v13 n7 p869-70 1965.

Descriptors: (*Martensite, *Crystal lattice defects), Steel, Austenite, Transformations, Twinning (Crystallography).

AD-639 056 **Field 11F, 20B, 13H**
CFSTI Prices: HC$1.00 MF$0.50
Pennsylvania Univ., Philadelphia. School of Metallurgical Engineering.
AN ELECTRON MICROSCOPE STUDY OF QUENCHED GOLD-PALLADIUM ALLOYS. I. A STUDY OF THE ELECTRICAL RESISTIVITY CHANGES PRODUCED BY QUENCHING AU PD ALLOYS. II. THE EFFECT OF QUENCHED-IN VACANCIES ON THE MECHANICAL PROPERTIES OF GOLD-PALLADIUM ALLOYS. III.
Annual summary rept. 1 Oct 65-30 Sep 66.
30 Sep 66, 3p
Contract Nonr-551 (55)

Descriptors: (*Gold alloys, *Crystal lattice defects), Palladium alloys, Foils, Electron microscopy, Resistance (Electrical), Mechanical properties, Quenching (Cooling), Single crystals, Wire.

A study was made of point defects in binary alloys. There are three phases of the research, the first concerned with electron microscopy of gold-palladium foils, the second with electrical resistivity changes produced by quenching in similar composition alloys, and the last concerned with the effect of quenching on mechanical properties of these alloys.

AD-639 140 **Field 11F, 7A**
Not available from CFSTI.
National Research Council of Canada, Ottawa (Ontario).
ORE SEPARATION IN A PACKED-FLUIDIZED BED.
by C. E. Capes, and J. P. Sutherland. 4 Oct 65, 8p NRC-9053
Canadian Chemical Engineering Conference (15th), Quebec City, Canada, October 1965.
Availability: Published in I/EC Process Design and Development v5 p330-6 Jul 1966.

Descriptors: (*Ores (Metal sources), Separation), Fluidized bed processes, Germanium, Iron, Canada.

The segregating tendency of particles of differing densities in a gas-fluidized packed bed was applied to ore separation. Two columns (5- and 3-cm. i.d.) filled with cylindrical screen packing were used to study the upgrading of a germanium ore and two iron ores. Segregation of the bed components was most efficient with air velocities just above that required for incipient fluidization. Bed height, location of the feed point, and ore feed rate also affected the degree of separation obtained. In the case of the germanium ore fluidized in a 5-cm. diameter bed 108 cm. high with the ore fed two thirds of the way up the bed, the maximum product grades and recovery attainable were achieved with feed rates up to 300 grams per minute. (Author)

AD-639 195 **Field 11F**
Not available from CFSTI.
Materials Science Center, Cornell Univ., Ithaca, N. Y.
HYDROGEN, OXYGEN, AND SUB-CRITICAL CRACK GROWTH IN A HIGH STRENGTH STEEL.
Final rept.
by G. G. Hancock, and H. H. Johnson. 1 Sep 65, 21p Rept. no. 402
Contract Nonr-3286 (01)
Proj. NRL-62-R05-19A
NRL-TM-278
Availability: Published in Trans. AIME.

Descriptors: (*Steel, Fracture (Mechanics)), Martensite, Hydrogen embrittlement, Oxygen, Tool steel.

Identifiers: Steel H-11.

Hydrogen gas at atmospheric pressure is shown to cause substantial embrittlement in a martensitic high strength steel. Subcritical crack growth is observed at very low stresses and with high growth rates. It is suggested that an adsorbed layer of hydrogen atoms at the crack tip surface provides the damaging hydrogen. Oxygen in small quantity, as little as 0.7%, is shown to eliminate sub-critical crack growth in gas environments caused by hydrogen or water vapor. However, dissolved oxygen in water has little or no influence upon crack growth rates. Oxygen stopped cracks may be restarted by water, or by hydrogen or water vapor if oxygen is removed from the environment. These observations are interpreted in terms of preferential adsorption of oxygen at the crack tip and the formation of an oxide barrier. (Author)

AD-639 209 **Field 11F, 20M**
CFSTI Prices: HC$2.00 MF$0.50
Chicago Univ., Ill. Dept. of Physics.
ELECTRONIC STRUCTURE OF THE LIQUID ALKALI METALS AND THEIR ALLOYS.
by Morrel H. Cohen. 1965, 30p

Descriptors: (*Liquid metals, Phase studies), (*Alkali metals, Electrons), (*Alkali metal alloys, Electrons), Magnetic properties, Optical properties, Anomalies, Thermodynamics.

Identifiers: Particle interactions.

The experimental evidence for strong Landau quasiparticle interactions in the alkali metals Na, K, and Cs is reviewed. It is speculated that an electron liquid phase intrudes at electron densities intermediate between those of the high density electron gas and low density Wigner crystal. It is argued that were this the case, there would be ferromagnetism or at least enhanced paramagnetism

above the critical point. The binary phase diagrams of the simple metals are reviewed. It is suggested that those phase diagrams involving the alkali metals are anomalous. It is proposed that the anomalies are understandable in terms of the electron gas-electron liquid phase transition if we suppose Li to have a gas-like electron configuration, but Na, K, Rb and Cs to have a liquid-like electron configuration. The phase separation in the molten Li-Na alloy system is then explained as the gas-liquid transition. The alkaline earth metals are difficult to fit into this picture, but the blue-to-bronze phase separation in liquid metal-NH3 solutions offers some support. (Author)

AD-639 216 **Field 11F**
CFSTI Prices: HC$1.00 MF$0.50
Virginia Polytechnic Inst., Blacksburg. Dept. of Metals and Ceramic Engineering.
THE RELATIONSHIP OF NITROGEN CONTENT OF A HIGH PURITY 20-20 AUSTENITIC STAINLESS STEEL TO STRESS CORROSION.
Final rept., 1 Jul 63-31 Jul 66.
by John F. Eckel, R. E. Smith, and A. B. Greene.
30 Jul 66, 25p
Grant DA-ARO (D)-31-124-G441
Proj. AROD-4099-MC
AROD-4099.2

Descriptors: (*Stainless steel, *Stress corrosion), Nitrogen, Austenite, Chromium alloys, Nickel alloys, Internal friction, Aging (Materials), Impurities.

The problem of stress corrosion cracking in austenitic stainless steels containing nitrogen has been studied, using a high purity 20 percent chromium, 20 percent nickel steel. The approach to the problem consisted of the determination of physical characteristics of the alloy as affected by nitrogen and the possibilities of nitrogen causing aging in such steels which could be associated with susceptibility to stress corrosion cracking. Specimens containing varying amounts of nitrogen were prepared and subjected to a dilatometric analysis on heating to 180 C, and the volume changes were studied, to observe solid state reactions in the alloy in this temperature range. A unique dilatometer was designed and constructed which permits the applications of constant tensile stresses over the range of temperature of interest. Specimens were tested in this instrument at various stress levels and at a constant heating rate. Internal friction measurements were also made by means of a torsional pendulum in the temperature range from ambient room temperature up to 300 C. (Author)

AD-639 248 **Field 11F, 20K**
Not available from CFSTI.
Washington Univ., Seattle.
DYNAMIC DEFORMATION OF METALS UNDER HIGH HYDROSTATIC PRESSURE.
by J. D. Chalupnik, and E. A. Ripperger. 1965, 8p
Grant DA-ARO (D)-31-124-G543
AROD-3267:2
Availability: Published in SESA International Congress on Experimental Mechanics (2nd) Texas Univ., Austin Sep 28-Oct 1 1965.

Descriptors: (*Copper, *Deformation), (*Hydrostatic pressure, Copper), Dynamics, Tests.

The authors describe a method that can be used to investigate the static and dynamic behavior of materials subjected to hydrostatic confining pressures in the range of zero to 100,000 psi. (Author)

AD-639 335 **Field 11F, 13H**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
THERMAL AND DILATOMETRIC EFFECTS DURING ANNEALING OF DEFORMED ZIRCONIUM.
by B. F. Slyusar. 23 Feb 66, 10p FTD-TT-65-1488
TT-66-62315
Unedited rough draft trans. of Akademiya Nauk URSR, Kiev. Instytut Metallofizyky. Sbornik Nauchnykh Rabot, v17 p68-71 1963.

Descriptors: (*Zirconium, Annealing), Deformation, Defects (Materials), Crystal lattice defects, Recrystallization, Energy, Thermal stability, USSR.

AD-639 419 **Field 11F**
CFSTI Prices: HC$3.00 MF$0.50
Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
ANODIC POLARIZATION BEHAVIOR OF TITANIUM AND TITANIUM ALLOYS IN SULFURIC ACID SOLUTIONS.
Master's thesis.
by James M. Peters. Jun 66, 56p GAM/MC-66B-5

Descriptors: (*Titanium alloys, Polarization), (*Corrosion, Titanium alloys), (*Titanium, Polarization), Anodes, Electric currents, Density, Voltage, Sulfuric acid, Solutions, PH.

The study was made to investigate the anodic polarization behavior of commercially-available titanium alloys in sulfuric acid solutions. Six materials were investigated at 22 plus or minus 1C using the potentiostatic technique. The electrolyte was 1, 5, and 10 normal concentrations of hydrogen-saturated, sulfuric acid. Anodic polarization curves (potential versus log current density) were obtained for all specimens in each of the three acid solutions. In addition, corrosion potential runs were determined for a 0.1N H2SO4 solution. All specimens display an active-to-passive transition. The alloy containing 13V-11Cr-3Al was the only specimen investigated which exhibited transpassive behavior in the normal range of interest (E sub corr to +3.0 volts). None of the specimens exhibited Tafel behavior for anodic dissolution in the active region or in the transpassive region. The passive current density, ip, was less than 20 microamps/sq cm for all specimens, indicating the presence of a stable passive film on the specimen surface. The magnitude of the passive current density, ip, did not vary significantly with acid concentration. The passivation potential, Ep, became more noble (positive) with increasing acid concentration. The magnitude of the critical current density, icr, increased with increasing acid concentration. The corrosion potential was essentially constant for the 1, 5, and 10 normal environments. It was more noble by 0.2 to 0.4 volts in 0.1N acid concentrations for all specimens except the Ti-8Al-1Mo-1V alloy, for which it is more noble by almost 0.7 volts. (Author)

AD-639 420 **Field 11F**
CFSTI Prices: HC$3.00 MF$0.75
Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
ANODIC POLARIZATION BEHAVIOR OF COBALT-CHROMIUM ALLOYS IN SULFURIC ACID SOLUTIONS.
Master's thesis.
by George Taylor Seamon. Jun 66, 65p GAM/MC-66B-6

Descriptors: (*Cobalt alloys, Polarization), (*Chromium alloys, Polarization), (*Corrosion, Cobalt alloys), Anodes, Cobalt, Chromium, Sulfuric acid, Solutions, Annealing, Voltage, Electric currents, Density, PH, Phase studies, Microstructure.

The anodic polarization behavior of annealed cobalt-chromium alloys in hydrogen saturated sulfuric acid solutions was investigated by using a potentiostatic technique. Polarization curves were obtained for eleven specimens, ranging from 100% cobalt to 100% chromium, in one normal, five normal, and ten normal sulfuric acid solutions at room temperature. The polarization curves for all specimens, except pure cobalt and the 95Co-5Cr alloy, exhibited active, passive, and transpassive behavior. Cathodic currents or loops were found in the passive region for all of the five specimens containing more than 30% chromium. Only the secondary active region was obtainable for five of the polarization curves, causing variation in the general trend of the polarization data. Increasing the acid concentration had the overall effect of shifting the polarization curves for each specimen in the noble direction. The general effect of increasing the chromium content was to shift the active region in the active direction without changing the transpassive region potential. Tafel behavior was observed in the transpassive region for all specimens containing more than 5% chromium. The Tafel slope varied from 0.168-0.239 for the high cobalt alloys to 0.038-0.048 for the high chromium alloys. As the chromium content of the specimens increased, the corrosion potential slowly became more active, except with six specimen-solution combinations where only secondary corrosion potentials were measurable. In all but two cases, the corrosion potential became more noble with an increase in pH. (Author)

AD-639 421 **Field 11F, 20M**
CFSTI Prices: HC$2.00 MF$0.50
Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
THE VAPOR PRESSURE OF COBALT BETWEEN 1693K AND 1753K AND CHEMICAL ACTIVITIES OF COBALT AND PLATINUM IN Co-Pt ALLOYS AT 1693K.
Master's thesis.
by George R. Winters II. Jun 66, 44p GAM/MC-66B-8

Descriptors: (*Cobalt, Vapor pressure), (*Cobalt alloys, High-temperature research), (*Platinum alloys, High-temperature research), Heat of sublimation, Thermodynamics, Phase studies.

The Knudsen effusion technique was used to determine seven values of the vapor pressure of pure solid cobalt between 1693 K and 1753 K and the vapor pressure of cobalt over five cobalt-platinum alloys at 1693 K, ranging in composition up to fifty-one atomic per cent platinum. Within the temperature range, the vapor pressure of cobalt is given by logP (atm.0 - -22,950/T + 7.57. Third law calculations gave a value for the heat of sublimation of cobalt at 298.15 K of 105,000 plus or minus 800 cal./mole. The activities of cobalt in the experimental alloys were calculated from the quotient of vapor pressures. Cobalt activity coefficients at higher platinum concentrations were extrapolated from a plot of N sub Co/N sub Pt versus ln gamma sub Co, and platinum activity coefficients were determined by graphical integration of the Gibbs-Duhem equation using the same plot. The activities of both cobalt and platinum in the alloys showed large negative deviations from Raoult's law. The integral free energies of mixing were determined to be negative, with the most negative value of -8300 cal./mole occuring at about forty-five atomic percent platinum. By then assuming the ideal entropy of mixing to be a limiting maximum value, it was found that the integral enthalpies of mixing must be negative. (Author)

AD-639 461 **Field 11F, 7D**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
MECHANISM OF OXIDATION OF SOME Ni-Cr-BASED ALLOYS.
by D. V. Ignatov, and R. D. Shamhunobs. 17 Jun 66, 12p FTD-TT-65-1919
TT-66-62335
Unedited rough draft trans. of Akademiya Nauk SSSR. Otdenlenie Teknicheskikh Nauk. Izvestiya Metallurgiya Toplivo, n3 p83-7 1959.

Descriptors: (*Nickel alloys, Oxidation), Chromium alloys, Aluminum alloys, Titanium alloys, High-temperature research, Reaction kinetics, USSR, Antioxidants.

Conclusions: (1) The rate of the oxidation of the binary alloy 80% Ni - 20% Cr is lower than the rate of oxidation of chromium at the temperature

of 800 - 1000 C. The cause of the greater heat resistance of the alloy, as compared with chromium, is to be found in the formation on the surface of the alloy of an oxide film, the outside layer of which consists of NiCr2o4 and a higher energy of the transition of the ions of the chromium into the oxide film from the alloy, as compared with pure chromium. (2) The rate of the oxidation of the nichrome alloy falls with the addition of aluminum. The effect of the aluminum appears plainly with the temperature above 700 C. For successful protection of the alloy Ni-Cr from oxidation up to the temperature of 900 C, there is sufficient content of aluminum in the alloy of the amount of 4 to 5%. For protection of the alloy at 1000 C, there is necessary the addition of aluminum to the amount of 7%. (Author)

AD-639 472 **Field 11F, 7D**
Not available from CFSTI.
Florida Univ., Gainesville. Coll. of Engineering.
THE DIFFUSION OF THE TRACER, Zn65, IN THE COPPER-RICH CORNER OF THE ALPHA SOLID SOLUTION IN THE SYSTEM Cu-Ni-Zn.
Technical paper.
by R. T. DeHoff, A. G. Guy, K. J. Anusavice, and T. B. Lindemer. 13 Oct 65, 8p Technical paper-358
Contract Nonr-580 (13)
Proj. NR-031-697
Rept. on Engineering Progress at Florida Univ. v20 n7 Jul 1966.
Availability: Published in Transactions of the Metallurgical Society of AIME v236 p881-7 Jun 1966.

Descriptors: (*Zinc, Diffusion), (*Copper alloys, Tracer studies), Solid solutions, Nickel alloys, Zinc alloys, Isotopes, Phase studies, Heat of activation.

As one of the approaches to understanding multicomponent diffusion, an experimental study is being made of tracer diffusion in the copper corner of the Cu-Ni-Zn system, out to 30 at. pct each of nickel and zinc, and in the 150 C range of temperature just below the solidus temperature. The results obtained using the Zn65 isotope are reported here, while studies with nickel and copper isotopes are planned for a future paper. The fifteen alloys investigated were melted in sealed vycor tubes, swaged, homogenized, and then analyzed, using the conventional isotope-plating plus lathe-sectioning technique. The data obtained show that the diffusion coefficient of the zinc isotope increases with increase in zinc content, and decreases with increase in nickel content. The correlation with solidus temperature is particularly strong. Diffusivities ranged from 6.6 x 10 to the minus 11th power to 1.0 x 10 to the minus 8th power sq cm per sec at the high-zinc, low-nickel compositions. The activation energy for tracer diffusion varied from 31,000 to 54,000 cal per mole. (Author)

AD-639 481 **Field 11F**
Not available from CFSTI.
Stanford Research Inst., Menlo Park, Calif.
EMBRITTLEMENT BY LIQUID METALS.
Final rept., 1 Mar 64-28 Feb 66.
by W. R. Goggin, and J. W. Moberly. 28 Feb 66, 10p
Contract None-4408 (00)
Proj. NR-036-058
Availability: Published in Transactions Quarterly v59 n2 p315-23 Jun 2 1966.

Descriptors: (*Aluminum, Embrittlement), (*Embrittlement, Liquid metals), Gallium, Foils, Fracture (Mechanics), Single crystals, Electron microscopy.

The aluminum-liquid gallium embrittlement couple was studied using techniques of transmission electron microscopy. Single and polycrystalline aluminum foils were wetted with liquid gallium and tested using a tensile device in an electron microscope. The influence of the liquid gallium on the fracture behavior of aluminum was observed. Polycrystalline aluminum can fail when wetted with liquid gallium by a grain boundary penetration of the metal by the liquid. This is a slow-failure process and is observed to occur with or without external loading, in both annealed and cold worked aluminum. However, if sufficient tensile stresses are applied, polycrystalline aluminum can also fail in a catastrophic manner with a high cracking velocity along intergranular paths. Liquid gallium is necessary for both crack nucleation and propagation. The crack was always observed to initiate in regions where grain boundary penetration of the aluminum had occurred. Thin layers of liquid metal were always detected along the fresh fracture surface. If insufficient gallium was present, the crack would become blunted and the metal would eventually experience ductile failure, characteristic of unwetted aluminum. Aluminum single crystals nearly always fail in a ductile manner, even when an abundant supply of liquid gallium is available. The liquid gallium can initiate microcracks in single-crystal aluminum, but the cracks do not propagate in the brittle manner observed in polycrystalline aluminum. (Author)

AD-639 484 **Field 11F, 13H**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
INFORMATION OF DEFORMATION RESISTANCE DURING PLASTIC DEFORMATION OF TITANIUM ALLOYS.
by I. M. Pavlov, E. G. Konstantinov, and A. E. Shelest. 6 Jun 66, 11p FTD-TT-65-1087
TT-66-62346
Unedited rough draft trans. of Akademiya Nauk SSSR. Institut Metallurgii, Moscow. Trudy, p28-31 (sic1964.

Descriptors: (*Titanium alloys, Deformation), Plasticity, Temperature, Stresses, USSR.

Conclusions: (1) The obtained strengthened plasticity characteristics of titanium alloys VT1, OT4, VT6, and VT14 were at a linear stressed state in conditions of static and dynamic actions of forces. (2) Comparison of deformation resistance of the mentioned alloys at various deformation rates shows, that in theoretical calculations values sigma sub (b) (st) in a temperature range of hot pressure treatment (700-1000C) can be used. (3) The ultimate strength sigma sub b sub D, obtained at dynamic elongation in the very same temperature range, is situated above the actual and calculated deformation resistances, which is explained by more considerable rates of deformation during dynamic elongation. (4) Plastic properties of alloys VT1, OT4, VT6, and VT14 (relative elongation and narrowing of the transverse section) decrease with an increase in rate of deformation. (Author)

AD-639 508 **Field 11F**
Not available from CFSTI.
Technion-Israel Inst. of Tech., Haifa. Dept. of Physics.
ON THE MOSSBAUER STUDY OF CEMENTITE.
by M. Ron, H. Shechter, A. A. Hirsch, and S. Niedzwiedz. 9 Feb 66, 5p
Grant AF-EOAR-71-63
Proj. AF-9763
Task 976302
AFOSR-66-1604
Availability: Published in Physics Letters v20 n5 p481-3 Mar 15 1966.

Descriptors: (*Iron, Phase studies), (*Steel, Phase studies), (*Grain structures (Metallurgy), *Mossbauer effect), Ferromagnetism, Nuclear spins, Gamma-ray spectra, Israel.

Identifiers: Cementite.

Mossbauer study on cast iron and two kinds of steels show two modifications of cementite, -one ferromagnetic and the other paramagnetic (at room temperature). The two forms were extracted as pure phases by HC1 and studied. (Author)

AD-639 555 **Field 11F, 20B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
ABOUT THE RELATION OF RECRYSTALLIZATION KINETICS WITH THE RELAXATION OF TENSIONS IN METALS.
by L. N. Aleksandrov, and V. N. Orlov. 7 Jun 66, 11p FTD-TT-65-1872
TT-66-62361
Unedited rough draft trans. of mono. Relaksatsionnye Yavleniya v Metallakh i Splavakh, Moscow, 1963 p294-9.

Descriptors: (*Metals, Internal friction), (*Recrystallization, Dynamics), Relaxation time, Tungsten, Molybdenum, Temperature, Microstructure, Crystal lattice defects, Heat of activation, USSR.

AD-639 567 **Field 11F, 14D, 13J**
Not available from CFSTI.
Pacific Naval Lab., Equimalt (British Columbia).
RELIABILITY AND CORROSION.
by R. D. Barer. 1966, 12p Reprint-66-2
Availability: Published in Naval Engineers Journal p321-31 Apr 1966.

Descriptors: (*Corrosion, Reliability), Aluminum alloys, Casting alloys, Stress corrosion, Pipes, Embrittlement, Cathodic protection, Stainless steel, Brass, Fatigue (Mechanics), Marine engineering, Canada, Corrosion inhibition.

The examples given and discussed are far from an exhaustive treatment of hazards between design office and field execution, of the need for attention to detail and of the weaknesses inherent in some alloys, of the importance of correct diagnosis and finally, that in some cases reliability can be restored. Reliability is not simple-it requires an attention to detail in choice of material and in design. It demands an understanding of corrosion mechanisms. (Author)

AD-639 599 **Field 11F, 13J**
CFSTI Prices: HC$4.00 MF$0.75
Naval Research Lab., Washington, D. C.
MARINE CORROSION STUDIES. STRESS CORROSION CRACKING, DEEP OCEAN TECHNOLOGY, CATHODIC PROTECTION, CORROSION FATIGUE.
Memorandum rept.
by T. J. Lennox Jr, M. H. Peterson, B. F. Brown, R. E. Groover, and R. L. Newbegin. May 66, 125p
NRL-MR-1711, Rept. no. 4
See also AD-621 743.

Descriptors: (*Corrosion, Sea water), (*Stress corrosion, Fracture (Mechanics)), (*Cathodic protection, Steel), (*Titanium alloys, Corrosion), Maraging steels, Nickel alloys, Wire, Cordage, Aluminum alloys, Antifouling coatings, Compatibility, Fatigue (Mechanics), Stainless steel.

Contents: Stress-corrosion studies, stress-corrosion cracking of a welded plate of 7-2-1 titanium alloy, a study of stress-corrosion cracking of titanium 8-1-1 alloy, stress-corrosion cracking of titanium alloys, stress-corrosion cracking studies on 12 percent nickel maraging and AISI 4340 high-strength steels, a comparison of three specimens for evaluating the susceptibility of high-strength steel to stress-corrosion cracking, the response of selected titanium alloys and high-strength steels to stress in salt water, progress note on simplifying NRL'S stress-corrosion cracking test procedure; Cathodic protection studies, stainless steel wire rope, aluminized steel wire rope, new sea water evaluation facility to study performance of anodes used in cathodic protection; Metallic corrosion studies, aluminum alloys; and antifouling paint compatability studies; Corrosion fatigue studies, the effects of three aqueous environments on high-stress low-cycle fatigue of an 18% nickel maraging steel, the effects of three aqueous environments on high-stress low-cycle fatigue of 18% nickel mar-

aging steels, a comparative evaluation of low-cycle fatigue crack propagation in 5Ni-Cr-Mo-V steels, low-cycle fatigue crack propagation and fractographic investigation of Ti-7Al-2Cb-1Ta and Ti-6Al-4V in air and in aqueous environments.

AD-639 603 **Field 11F, 20B**
CFSTI Prices: HC$1.00 MF$0.50
Franklin Inst. Research Labs., Philadelphia, Pa.
THE MICROSTRAIN REGION IN HIGH-PURITY REFRACTORY METALS.
Quarterly rept. no. 2, 1 Jun-31 Aug 66.
by H. L. Prekel, A. Lawley, and J. D. Meakin. 31 Aug 66. 21p Rept. no. Q-B2195-2
Contract Nonr-4434 (00)
See also AD-634 128.

Descriptors: (*Refractory metals, *Strain (Mechanics)), (*Molybdenum, *Crystal lattice defects), Single crystals, Metallic crystals, Annealing, Microstructure, Elasticity, Stresses, Zone melting.

It is shown that the hydrogen annealing treatments (described in AD-639 603) which are required in the preparation of molybdenum single crystals suitable for dislocation velocity experiments leave the remaining dislocations in an unpinned state. Some tentative dislocation velocity determinations are presented leading to an activation volume v* approx. 20b to the third power in agreement with values of v* = 15b to the third power found by strain-rate change experiments in the macro-strain region. The micro-strain behavior of molybdenum single crystals treated in hydrogen in a similar fashion is examined. The true elastic limit tau sub E. the dissipative friction stress tau sub F, and the activation volume v* are found to be: tau sub E = 0.07 plus or minus 0.0002 Kg/sq. mm tau sub F = 0.04 plus or minus Kg/sq mm and v* approx. 1700b to the third power. These results are compared to those obtained with as zone-refined crystals. (Author)

N66-24343 **Field 11F**
CFSTI Prices HC$3.00 MF$0.50
Commissariat A L Energie Atomique, Paris (France).
STEELS FOR REACTOR VESSELS. IRRADIATION OF STEEL SAMPLES IN EL3 AT VARIOUS TEMPERATURES AND TESTING AFTER IRRADIATION.
Aciers Pour Caissons De Reacteurs. Irradiation D'eprouvettes D'aciers Dans El3 A Differentes Temperatures Et Essais Apres Irradiation
by M. Cibois, J. Lemaire, and M. Weisz. 1966, 57p EUR-2660.F, EURAEC-1502
Contract EURATOM-039-61-12 RDF
In French, English Summary

Descriptors: Carbon, Damage, Dose, Equation, Fast, *Fast neutron, *Hardening, *Irradiation, Manganese, Molybdenum, Neutron, Peak, Radiation, Reactor, *Steel, Temperature, Testing, Value, *Vessel.

For abstract, see S 04 13.

N66-24411 **Field 11F**
CFSTI Prices HC$2.00 MF$0.50
Weapons Research Establishment, Salisbury (Australia).
THE EFFECTS OF TEMPERATURE AND CREEP ON THE FAILURE PRESSURES OF COMMERCIALLY PURE ALUMINUM SHEARING DISCS UNDER HYDROSTATIC LOADING.
by B. E. Furby. Dec 65, 34p CPD-106

Descriptors: *Aluminum, Creep, *Disk, *Failure, Hydrostatic, *Hydrostatic pressure, Loading, Pressure, Shear, *Shear creep, Temperature.

For abstract, see S 04 13.

N66-24419 **Field 11F**
CFSTI Prices HC$3.00 MF$0.75
General Electric Co., San Jose, Calif.
SPECIFIC ZIRCONIUM ALLOY DESIGN PROGRAM SUMMARY REPORT.
by H. H. Klepfer. 1966, 99p EURATOM-2683-E, EURAEC-1193
Contract AT/04-3/-189

Descriptors: Activation, Alloy, Chromium, Copper, *Corrosion, Diffusion, Energy, Film, *Hydride, Iron, Mechanical, Metallurgy, Niobium, Oxidation, Oxide, Oxygen, Plasticity, Property, Substrate, Yttrium, Zirconium, *Zirconium alloy.

For abstract, see S 04 13.

N66-24451 **Field 11F, 18H**
CFSTI Prices HC$1.50 MF$0.75
Atomic Energy Of Canada, Ltd., Chalk River (Ontario).
AECL EXPERIMENTS ON THE CORROSION OF ZIRCONIUM ALLOYS UNDER IRRADIATION.
by B. Cox. May 65, 82p AECL-2257

Descriptors: Absorption, Alloy, Analysis, Cladding, *Corrosion, Element, Film, Fuel, Hydrogen, *Irradiation, Oxidation, Oxide, *Reactor, Reduction, Thickness, Zircaloy, Zirconium, *Zirconium alloy.

For abstract, see S 04 13.

N66-24488 **Field 11F**
CFSTI Prices HC$5.00 MF$0.75
Syracuse Univ. Research Inst., N. Y.
MATERIALS DATA HANDBOOK - ALUMINUM ALLOY 2219.
by J. Sessler, and V. Weiss. Mar 66, 185p NASA-CR-74545
Contract NAS8-11345

Descriptors: Alloy, Aluminum, *Aluminum alloy, Ambient, Cryogenic, *Cryogenic temperature, Data, *Handbook, Material, Mechanical, *Mechanical property, Metallurgy, Physical, *Physical property, Property, Surface, Temperature.

For abstract, see S 04 13.

N66-24585 **Field 11F**
CFSTI Prices HC$7.00 MF$1.75
Martin Co., Denver, Colo.
ANALYTICAL AND STATISTICAL STUDY ON THE EFFECTS OF POROSITY LEVEL ON WELD JOINT PERFORMANCE TECHNICAL SUMMARY REPORT, 1 JUL. 1964 - 29 MAR. 1966.
by J. F. Rudy, and E. J. Rupert. Mar 66, 343p NASA-CR-74595, CR-66-15
Contract NAS8-11335

Descriptors: Alloy, Aluminum, *Aluminum alloy, Axis, Contamination, Effect, Fatigue, Helium, Hydrogen, Joint, Longitudinal, Mechanical, *Mechanical property, Metal, Performance, *Porosity, Property, Radiography, Strength, Tensile, Transverse, *Weld strength, *Welded joint, Welding.

For abstract, see S 04 13.

N66-24695 **Field 11F**
CFSTI Prices HC$7.00 MF$1.75
Lockheed-Georgia Co., Marietta.
EFFECT OF NUCLEAR RADIATION ON MATERIALS AT CRYOGENIC TEMPERATURES FINAL REPORT.
by C. A. Schwanbeck. Jan 65, 303p NASA-CR-54881, LAC-ER-8434
Contracts NAS3-7987, NASW-114

Descriptors: Alloy, Aluminum, *Aluminum alloy, Bombardment, Cryogenic, *Cryogenic temperature, Iron, *Iron alloy, Neutron, *Neutron bombardment, Nickel, *Nickel alloy, Notch, Property, Strength, Temperature, Tensile, *Tensile strength, Titanium, *Titanium alloy, Yield.

For abstract, see S 04 13.

N66-24897 **Field 11F**
CFSTI Prices HC$1.00 MF$0.50
Polish Academy Of Sciences, Warsaw.
A NEUTRON DIFFRACTION INVESTIGATION OF SOME IRON-TUNGSTEN CARBIDES.
Neutronograficzne Badanie Niektorych Weglikow Zelazowo-wolframowych
by Z. Bojarski, and J. Leciejewicz. Nov 65, 19p INR-665/II/PS

Descriptors: Alloy, *Carbide, Compound, Crystal, *Crystal structure, Diffraction, Intermetallics, Iron, *Iron alloy, Neutron, *Neutron diffraction, Structure, System, Ternary, Tungsten, *Tungsten alloy.

For abstract, see S 04 13.

N66-24899 **Field 11F**
CFSTI Prices HC$1.00 MF$0.50
Polish Academy Of Sciences, Warsaw.
SOME PROPERTIES OF U- MO 1 PERCENT WT. ALLOY AFTER THERMAL TREATMENT.
Niektore Wlasnosci Obrobioneco Cieplnie Stopu U-mo 1 Percent Ciez.
by A. Hofman. May 65, 17p INR-645/XIV/PS
In Polish, English Summary

Descriptors: Alloy, Crystal, *Crystal structure, Cycling, Dimensional, Heat, *Heat treatment, Mechanical, *Mechanical property, Property, Stability, Structure, Thermal, Treatment, Uranium, *Uranium alloy.

For abstract, see S 04 13.

N66-24914 **Field 11F**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
DETERMINATION OF THE SURFACE STATE OF METAL POWDER PARTICLES BY SCATTERING OF LIGHT.
Opredeleniye Sostoyaniya Poverkhnosti Metallicheskikh Poroshkovykh Chastits Po Rasseyaniyu Sveta
by A. I. Raychenko. Apr 66, 15p NASA-TT-F-10086
Transl. Into English From Poroshkovaya Met., Akad. Nauk Ukr. Ssr (Kiev), V. 33, No. 9, 1965 P 69-75

Descriptors: Absorption, Diffraction, Index, Light, *Light scattering, Metal, *Metal particle, Metallurgy, Particle, Powder, *Powder metallurgy, Reflection, Roughness, Scattering, Surface, *Surface roughness, U.s.s.r..

For abstract, see S 04 13.

N66-25004 **Field 11F**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPATIBILITY OF COLUMBIUM AND TANTALUM TUBING ALLOYS WITH REFLUXING POTASSIUM.
by C. A. Barrett, and C. M. Scheuermann. May 66, 45p NASA-TN-D-3429

Descriptors: Alloy, Capsule, Columbium, Container, Corrosion, *Corrosion resistance, Fluid, Getter, Metallography, *Niobium, *Potassium, Resistance, Tantalum, *Tantalum alloy, Temperature, Thermodynamic, Tubing, Working.

For abstract, see S 04 13.

N66-25005 **Field 11F**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.

ACCELERATED CAVITATION DAMAGE OF STEELS AND SUPERALLOYS IN LIQUID METALS.
by J. R. Johnston, and S. G. Young. May 66, 43p NASA-TN-D-3426

Descriptors: Alloy, Base, Blade, *Cavitation, Cobalt, Conversion, *Damage, Impeller, Iron, Liquid, *Liquid metal, Metal, Nickel, Power, *Power conversion, Pump, Resistance, Roughness, *Superalloy, Surface.

For abstract, see S 04 13.

N66-25247 **Field 11F**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
EVALUATION OF SPECIAL 301-TYPE STAINLESS STEEL FOR IMPROVED LOW TEMPERATURE NOTCH TOUGHNESS OF CRYOFORMED PRESSURE VESSELS.
by T. W. Orange. May 66, 20p NASA-TN-D-3445

Descriptors: Composition, Cryogenic, Low temperature, Modification, Notch, *Notch strength, Pressure, *Pressure vessel, Stainless, *Stainless steel, Steel, Strength, Stress, Toughness, Vessel, Welding.

For abstract, see S 04 13.

N66-25383 **Field 11F**
CFSTI Prices HC$6.00 MF$1.25
Battersea Coll. Of Technology, London (England).
ACTIVATION SINTERING OF TUNGSTEN AND ITS EFFECT ON SOME MECHANICAL PROPERTIES FINAL REPORT, 1 OCT. 1962 - 31 DEC. 1965.
by I. J. Toth. Nov 65, 234p AD-630440
Contract N62558-3591

Descriptors: Activation, Atmosphere, Bromine, Compound, *Halogen, Hydrogen, Mechanical, *Mechanical property, Metal, *Metal compound, Nickel, Palladium, Property, Salt, *Sintering, *Tungsten.

For abstract, see S 04 13.

N66-25556 **Field 11F**
CFSTI Prices HC$3.00 MF$0.50
General Electric Co., Cincinnati, Ohio.
MEASUREMENT OF THE PERMEABILITY OF TUNGSTEN TO HYDROGEN AND TO OXYGEN FINAL REPORT.
by E. A. Aitken, P. K. Conn, E. C. Duderstadt, and R. E. Fryxell. May 66, 53p NASA-CR-54918
Contract NAS3-6216

Descriptors: Coefficient, Helium, High temperature, *Hydrogen, Isotherm, Measurement, Membrane, Oxide, *Oxygen, *Permeability, Rate, *Tungsten.

For abstract, see S 04 14.

N66-26048 **Field 11F**
CFSTI Prices HC$1.00 MF$0.50
Chalmers Univ. Of Technology, Goteborg (Sweden).
AN X-RAY CAMERA FOR DISLOCATION STUDIES IN NEARLY PERFECT CRYSTALS.
by T. Claeson, and L. Gerward. 1965, 21p
Its Trans. No. 303 (Avd. Allm. Vetenskaper 35)

Descriptors: *Camera, Crystal, *Crystal dislocation, Dislocation, Germanium, Mapping, Photography, Single, *Single crystal, Structure, X-ray, *X-ray photography.

For abstract, see S 04 14.

N66-26169 **Field 11F**
CFSTI Prices HC$2.00 MF$0.50
Chalmers Univ. Of Technology, Goteborg (Sweden).
STRESS REVERSALS IN CONNECTION WITH PRIMARY CREEP.
by L. Sonnerup. 1965, 26p
Its Trans. No. 295

Descriptors: Analysis, Axial, *Axial stress, *Creep, Engineering, Fatigue, Hardening, Internal, Law, Loading, Loading rate, Primary, Rate, Reversal, Strain, *Strain hardening, Stress, Structural.

For abstract, see S 04 14.

N66-26236 **Field 11F**
CFSTI Prices HC$2.00 MF$0.50
Iit Research Inst., Chicago, Ill.
GRAPHITE-METAL COMPOSITES QUARTERLY REPORT NO. 3, FEB. 1 - MAY 1, 1966.
by Y. Harada. 21 Apr 66, 42p NASA-CR-74904, IITRI-G6003-3
Contract NASR-65/09/

Descriptors: Composite, *Composite material, Composition, Graphite, High temperature, Hot, *Hot pressing, Liquid, Material, Measurement, Mechanical, Metal, Molybdenum, Niobium, Phase, Pressing, Property, *Sintering, Tantalum, Vanadium.

For abstract, see S 04 14.

N66-26246 **Field 11F**
CFSTI Prices HC$5.00 MF$1.00
Westinghouse Electric Corp., Pittsburgh, Pa.
AN EXPERIMENTAL INVESTIGATION OF THE RE-ENTRY BEHAVIOR OF METALS AND ALLOYS.
by J. M. Bridges, and R. N. Pinchok. 31 Dec 64, 152p NASA-CR-75093, WANL-TNR-192

Descriptors: *Ablation, Alloy, Aluminum, Atmospheric, Beryllium, Engine, Entry, Fracture, Inconel, Jet, *Metal, Nerva, Nuclear, *Nuclear engine for rocket vehicle (nerva), *Oxidation, Oxide, Plasma, Reactor, *Reentry, Rocket, Simulation, Stainless, Steel, Titanium, Vehicle.

For abstract, see S 04 14.

N66-26662 **Field 11F**
CFSTI Prices HC$1.00 MF$0.50
Massachusetts Inst. Of Tech., Cambridge.
DISPERSION STRENGHTHENING OF METALS PROGRESS REPORT, SEP. 1965 - FEB. 1966.
by H. Dalal, G. Ewell, N. J. Grant, F. Hunkeler, and W. Schilling. 1966, 17p NASA-CR-75136
Grant NSG-117

Descriptors: Alloy, Aluminum, Apparatus, Beryllium, *Beryllium alloy, Chemical, Chromium, Controllability, Copper, Deformation, Iron, *Iron alloy, Machining, Metallurgy, Microstructure, *Oxidation, Powder, *Powder metallurgy, Precipitation, Reaction, Rolling, Zone.

For abstract, see S 04 14.

N66-26665 **Field 11F**
CFSTI Prices HC$1.00 MF$0.50
New York Univ., N. Y.
INVESTIGATION OF THE EFFECT OF PRESSURE ON METALLURGICAL PHENOMENA FINAL REPORT, 20 JUN. 1960 - 30 SEP. 1965.
by I. Cadoff, H. Margolin, E. Pan, and B. Siegel. 1965, 22p NASA-CR-75106
Grant NSG-90

Descriptors: Alloy, Apparatus, Effect, Electric, Isotherm, Lead, *Lead alloy, Pressure, *Pressure effect, Resistance, Resistivity, Semiconductor, Solubility, Telluride, Testing, *Thallium, Tin, *Tin telluride, Topology, X-ray.

For abstract, see S 04 14.

N66-26730 **Field 11F**
CFSTI Prices HC$1.00 MF$0.50
Royal Inst. Of Tech., Stockholm (Sweden).
SOME VIEWPOINTS ON PLASTIC DEFORMATION CONNECTED WITH FRACTURE IN METALS.
Nagra Synpunkter Pa Plastisk Deformation I Samband Med Brott
by G. Ostberg. 1965, 24p PUBL.-150
In Swedish, English Summary

Descriptors: Anisotropy, *Brittleness, Concentration, Container, Crystal, Deformation, Ductility, Failure, *Fracture, Grain, Hardening, *Metal, Nonuniform, Plastic, *Plastic deformation, Point, Pressure, Stability, Strain, Stress, Structure, Uniform, Yield.

For abstract, see S 04 14.

N66-26732 **Field 11F**
CFSTI Prices HC$3.00 MF$0.50
France. Office National D Etudes Et De Recherches Aerospatiales, Chatillon-sous-bagneux.
THE BREATHING-VIBRATIONS OF A THIN CYLINDER PARTIALLY FILLED WITH A FLUID.
Vibrations De Respiration D'un Cylindre Mince Partiellement Rempli De Liquide
by J. Leroy. 1965, 55p PUBL.-113
In French, English Summary

Descriptors: Analysis, Boundary, Condition, *Cylinder, Frequency, Internal, *Liquid, Mode, *Mode of vibration, Natural, *Natural frequency, Pressure, Vibration.

For abstract, see S 04 14.

N66-26734 **Field 11F**
CFSTI Prices HC$2.00 MF$0.50
Royal Inst. Of Tech., Stockholm (Sweden).
FOUNDATIONS OF THE MATHEMATICAL THEORY OF BRITTLE FRACTURE. SOME RECENT PROBLEMS OF KINETICS OF CRACKS. THEORY OF BRITTLE STRENGTH. SOME RECENT ADVANCES IN THE THEORY OF CRACKS IN NON-HOMOGENEOUS BODIES.
by G. I. Barenblatt. 1965, 35p PUBL.-149
Guest Lectures Presented At Roy. Inst. Of Tech., Nov. 1964

Descriptors: *Brittleness, Cohesion, *Crack, Equilibrium, Formation, Fracture, *Fracture mechanics, Laminate, Mathematics, Mechanics, Plate, Propagation, Strength.

For abstract, see S 04 14.

N66-26752 **Field 11F**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
THE EFFECT OF MODERATELY ELEVATED TEMPERATURE ON THE FATIGUE LIVES OF NOTCHED (KT EQUALS 4) SPECIMENS WHICH CONTAIN RESIDUAL STRESS.
by L. A. Imig. Apr 66, 65p NASA-TM-X-57565

Descriptors: Alloy, Aluminum, *Aluminum alloy, Duration, Fatigue, *Fatigue life, Life, Metal, *Metal fatigue, Molybdenum, *Molybdenum alloy, Notch, Sheet, Stress, Temperature, Titanium, *Titanium alloy.

For abstract, see S 04 14.

N66-26862 **Field 11F**
CFSTI Prices HC$3.00 MF$0.75
Westinghouse Electric Corp., Pittsburgh, Pa.
DETERMINATION OF THE WELDABILITY AND ELEVATED TEMPERATURE STABILITY OF REFRACTORY METAL ALLOYS NINTH QUARTERLY REPORT, 21 JUN. - 20 SEP. 1965.

by G. G. Lessmann, and D. R. Stoner. 1965, 77p NASA-CR-54923, WANL-PR/P/-009
Contract NAS3-2540

Descriptors: Alloy, Arc, Electric power, Gas, Joint, Niobium, Power, Refractory, *Refractory alloy, Space, Strength, Supply, System, Tantalum, Tensile, *Tensile strength, *Thermostability, Tungsten, *Welded joint, Welding.

For abstract, see S 04 14.

N66-26863 Field 11F
CFSTI Prices HC$2.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa.
DEVELOPMENT OF DISPERSION STRENGTHENED TANTALUM BASE ALLOY EIGHTH QUARTERLY PROGRESS REPORT, 20 AUG. - 20 NOV. 1965.
by R. W. Buckman Jr, and R. C. Goodspeed.
1966, 42p NASA-CR-54935, WANL-PR/Q/-009
Contract NAS3-2542

Descriptors: Alloy, Carbon, Diffraction, Dispersion, *Dispersion hardening, Electron, Hafnium, Hardening, Identification, *Metallurgy, Microscopy, Morphology, Optical, Phase, Power, Processing, Rhenium, Space, Tantalum, *Tantalum alloy, X-ray.

For abstract, see S 04 14.

N66-34317 Field 11F
CFSTI Prices HC$2.00 MF$0.50
Battelle Memorial Inst., Columbus, Ohio.
AN INVESTIGATION OF THE REACTION OF TITANIUM WITH HYDROGEN SUMMARY REPORT.
by W. Hodge, B. G. Koehl, and D. N. Williams.
14 Jul 66, 49p NASA-CR-65456
Contract NAS9-5298

Descriptors: Alloy, Chemical, Consistency, Control, Environment, Gas, *Gas-metal interaction, *Hydrogen, Interaction, Low pressure, Low temperature, *Low temperature environment, Mechanical, Metal, Reaction, Titanium, *Titanium alloy.

For abstract, see S 04 20.

N66-34653 Field 11F
CFSTI Prices HC$2.00 MF$0.50
Manlabs, Inc., Cambridge, Mass.
ANALYSIS OF VAPORIZATION OF LIQUID URANIUM, METAL, AND CARBON SYSTEMS AT 9000 DEG AND 10,000 DEG R.
by L. Kaufman, and E. T. Peters. Sep 66, 49p NASA-CR-591
Contract NAS3-8036

Descriptors: Alloy, *Carbon, Exchanger, Gas, Heat, Hydrogen, Liquid, *Liquid metal, Metal, Pressure, System, Tungsten, *Uranium, Vapor, *Vaporization.

For abstract, see S 04 20.

N66-34694 Field 11F
CFSTI Prices HC$2.00 MF$0.50
Battelle Memorial Inst., Columbus, Ohio.
A STUDY OF HYDROGEN EMBRITTLEMENT OF VARIOUS ALLOYS ANNUAL SUMMARY REPORT, 24 JUN. 1965 - 23 JUN. 1966.
by A. R. Elsea, E. E. Fletcher, and T. P. Groeneveld. 23 Jun 66, 50p NASA-CR-77374
Contract NAS8-20029

Descriptors: *Alloy, Cleaning, Crack, Electroplating, *Embrittlement, Failure, *Hydrogen, Metal, Metallurgy, Notch, *Notched metal, Stress, Tensile.

For abstract, see S 04 20.

N66-34696 Field 11F
CFSTI Prices HC$2.00 MF$0.50
Case Inst. Of Tech., Cleveland, Ohio.
EFFECTS OF HYDROSTATIC PRESSURE ON THE MECHANICAL BEHAVIOR OF BODY CENTERED CUBIC REFRACTORY METALS AND ALLOYS INTERIM TECHNICAL REPORT NO. 4, 1 JUN. 1965 - 1 JUN. 1966.
by G. Das, S. V. Radcliffe, and P. Trester. Jun 66, 45p NASA-CR-77383
Grant NSG-654

Descriptors: Alloy, Body, *Body centered cubic (bcc) crystal, Carbon, Center, Crystal, Cubic, Hydrostatic, *Hydrostatic pressure, Iron, Mechanical, *Mechanical property, Metal, Pressure, Property, Refractory, *Refractory metal, Tensile, Tungsten.

For abstract, see S 04 20.

N66-34703 Field 11F
CFSTI Prices HC$2.00 MF$0.50
Aluminum Co. Of America, New Kensington, Pa.
STUDY OF CRACK INITIATION PHENOMENA ASSOCIATED WITH STRESS CORROSION OF ALUMINUM ALLOYS LITERATURE SURVEY.
by E. H. Hollingsworth, R. L. Horst, M. S. Hunter, and J. Mc hardy. 5 Aug 66, 38p NASA-CR-77361
Contract NAS8-20396

Descriptors: Alloy, Aluminum, *Aluminum alloy, Bibliography, Corrosion, Crack, *Crack propagation, Initiation, Literature, Propagation, Stress, *Stress corrosion, Survey.

For abstract, see S 04 20.

N66-34804 Field 11F
CFSTI Prices HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
THE PEST PHENOMENON IN INTERMETALLICS QUARTERLY REPORT.
by J. Berkowitz, and M. Rossetti. 28 Jul 66, 9p NASA-CR-77395
Contract NASW-1403

Descriptors: Base, Boules, Compound, Crystal, Disilicide, Failure, *Fatigue, Level, Molybdenum, *Molybdenum compound, Single, *Single crystal, Static, *Static testing, Strength, Testing.

For abstract, see S 04 20.

N66-34864 Field 11F
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROCEDURES FOR EXTERNALLY LOADING AND CORROSION TESTING STRESS CORROSION SPECIMENS.
by T. S. Humphries. 29 Jun 66, 39p NASA-TM-X-53483

Descriptors: Alloy, Aluminum, *Aluminum alloy, Chloride, Corrosion, External, Ferrous, Immersion, Iron, *Iron alloy, *Loading, Nickel, *Nickel alloy, Procedure, Sodium, Solution, Stress, *Stress corrosion.

For abstract, see S 04 20.

N66-34938 Field 11F
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
INVESTIGATION OF COLUMBIUM-MODIFIED NASA TAZ-8 SUPERALLOY.
by J. C. Freche, and W. J. Waters. Aug 66, 34p NASA-TN-D-3597
Contract 129-03-01-03-22

Descriptors: Aerospace, Alloy, Aluminum, Application, Boron, *Boron alloy, Chromium, Columbium, High temperature, Molybdenum, *Niobium, Oxidation, *Oxidation resistance, Resistance, Strength, *Superalloy, Tantalum, Tungsten, Vanadium, Zirconium.

For abstract, see S 04 20.

N66-35022 Field 11F
CFSTI Prices HC$3.00 MF$0.75
Case Inst. Of Tech., Cleveland, Ohio.
MODIFIED EUTECTIC ALLOYS FOR HIGH TEMPERATURE SERVICE SECOND YEAR INTERIM REPORT, MAY 1965 - JUN. 1966.
by S. F. Ramseyer, and J. F. Wallace. 1966, 78p NASA-CR-77385
Grant NSG-639

Descriptors: Alloy, Binary, Cast, Cobalt, *Cobalt alloy, Eutectic, High temperature, Mechanical, *Mechanical property, *Metallurgy, Modification, Nickel, *Nickel alloy, Property, Refinement, Structure, Tungsten, *Tungsten alloy.

For abstract, see S 04 20.

N66-35047 Field 11F
CFSTI Prices HC$2.50 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
STRUCTURE AND PROPERTIES OF TUNGSTEN-BASE POWDER METALLURGY COMPOSITES.
by T. P. Herbell, M. Quatinetz, and J. W. Weeton. Sep 66, 52p NASA-TN-D-3610
Contract 129-03-01-05-22

Descriptors: Canning, Cleaning, Composite, *Composite material, Density, Extrusion, Grain, Hardness, Lattice, Material, *Mechanical property, Metallurgy, *Microstructure, Oxide, Parameter, Powder, *Powder metallurgy, Pressing, Property, Rupture, Sintering, Size, Strength, Stress, Tantalum, Tensile, Testing, *Tungsten, Zirconium.

For abstract, see S 04 20.

N66-35175 Field 11F
CFSTI Prices HC$1.00 MF$0.50
Stanford Univ., Calif.
MECHANISMS OF STRENGTHENING AND FRACTURE IN COMPOSITE MATERIALS PROGRESS REPORT NO. 4, DEC. 1, 1965 - JUN. 1, 1966.
by A. S. Tetelman. 1966, 12p NASA-CR-77451
Grant NSG-622

Descriptors: Behavior, Carbide, Composite, *Composite material, Electron, Fiber, *Fiber strength, Fractography, *Fracture, Influence, Iron, Material, *Materials science, Matrix, Mechanism, Metal, Microscope, Molybdenum, Nickel, Sintering, Steel, Strength, Titanium.

For abstract, see S 04 20.

N66-35177 Field 11F
CFSTI Prices HC$6.00 MF$1.50
Southwest Research Inst., San Antonio, Tex.
DEVELOPMENT OF WELDING TECHNIQUES AND FILLER METALS FOR HIGH STRENGTH ALUMINUM ALLOYS FINAL REPORT.
by H. C. Burghard Jr, and E. B. Norris. 7 May 66, 281p NASA-CR-77511
Contracts NAS8-1529, NAS8-20160

Descriptors: Alloy, Aluminum, *Aluminum alloy, Biaxis, Characteristics, Development, Filler, High strength, *High strength alloy, Improvement, Metal, Metallurgy, Microstructure, Technique, Tensile, Testing, Uniaxial, *Welding.

For abstract, see S 04 20.

N66-35242 Field 11F
CFSTI Prices HC$2.00 MF$0.50
Florida Univ., Gainesville.

A STUDY OF DEFECT STRUCTURES WITH THE FIELD ION MICROSCOPE FIRST SEMIANNUAL REPORT, 1 MAR. - 31 AUG. 1966.
by J. J. Hren. 1966, 33p NASA-CR-77476
Contract NGR-10-005-039

Descriptors: Alloy, Atom, Computer, *Computer simulation, Defect, Image, Imperfection, Ion, *Ion microscope, Lattice, *Lattice imperfection, Microscope, Molybdenum, *Molybdenum alloy, Nickel, *Nickel alloy, Simulation.

For abstract, see S 04 20.

N66-35319 **Field 11F**
CFSTI Prices HC$1.00 MF$0.50
Battelle Memorial Inst., Columbus, Ohio.
THE EFFECT OF COOLING RATE ON THE DUCTILE- BRITTLE BEND-TRANSITION TEMPERATURE OF CHROMIUM WIRE.
by A. Gilbert, and M. J. Klein. Nov 65, 9p
NASA-CR-68115
Contracts NASW-101, W-7405-ENG-92
Submitted For Publication

Descriptors: Alloy, Bending, Brittleness, Chromium, *Chromium alloy, Cooling, Ductility, Interstitial, Mechanical, *Mechanical property, Metal, Nitrogen, Point, Property, Rate, Refractory, *Refractory metal, Temperature, Tensile, Transition, *Transition point, Wire.

For abstract, see S 04 20.

PB-172 425 **Field 11F**
CFSTI Prices: HC$4.60 MF$0.50
Lockheed Missiles and Space Co., Sunnyvale, Calif.
STUDIES OF THE GAS CARBURIZATION OF NIOBIUM.
Technical rept.
by A. Ottenberg. Jan 60, 45p LMSD-288234
AD-239347

Descriptors: (*Niobium, *Case hardening), Phase studies, Niobium compounds, Carbides, Grain structures (Metallurgy), Mechanical properties, Films.

Identifiers: Niobium carbides.

Studies were undertaken of the gas-carburization of metallic niobium. Results indicate that the mechanism at the gas-solid interface proceeds through the formation of a chemical complex between the hydrocarbon gas and the surface. This action is followed by the stripping-off of hydrogen to yield a chemically bound carbon atom which can then diffuse into the interior. The reactive diffusion of the carbon into the interior yields a hemicarbide phase (Nb2C) which enters the core by intergranular penetration. A monocarbide phase (NbC) follows, which penetrates the hemicarbide phase along a sharp boundary. The penetrations by the hemicarbide and monocarbide phases proceed simultaneously. Examination of the monocarbide phase, which is extremely brittle and does not adhere well, indicates that it would have little engineering application in the state produced. The hemicarbide phase can be formed as an essentially pure, adherent film on the metallic core. Nothing is presently known of the engineering properties of this film. (Author)

PB-172 954 **Field 11F**
CFSTI Price: HC$3.60
Ship Structure Committee, Washington, D. C.
INFLUENCE OF HOT-ROLLING CONDITIONS ON BRITTLE FRACTURE IN STEEL PLATE.
Progress rept. no. 1.
by F. de Kazinczy, and W. A. Backofen. 10 Nov 60, 33p SSC-126
Proj. SR-147
AD-247 562
Prepared in cooperation with Oxelosunds Jarn verksaktiebolag (Sweden) under contract NObs-72046, and Massachusetts Inst. of Tech., Cambridge, under contract NObs-72386.

Descriptors: (*Fracture (Mechanics), *Metal plates), (*Steel, Rolling (Metallurgy)), Brittleness.

Steel plates processed according to a conventional and controlled (low finishing temperature) rolling practice were studied to establish reasons for a superior notch toughness in the controlled-rolled product. The lower transition temperature (Charpy V-notch 15 ft-lb) in plates investigated is derived largely from a smaller ferrite grain size. Experimental evidence was also obtained to indicate that a part of the improvement results from a microfissuring in the plane of the plate at the notch root, with the effect that stress triaxiality is relieved and transition temperature depressed. The origin of the flaws responsible for the fissures was not determined with certainty, but there was good indication that they were simply inclusions in a fiber structure too fine in scale for observation with normal metallographic techniques. The criteria presented for microfissuring were: (1) a flaw structure dispersed on a scale no greater than the size of the plastic volume from which the brittle crack originated; (2) a ratio of the critical fracture stress in thickness (Z) to rolling (R) direction no greater than about 1/2. The necessary fracturing anisotropy was favored by more intense fibering and finer grain size. The criteria were most nearly satisfied by controlled-rolled plate. (Author)

PB-173 260
Field 11F
CFSTI Prices: HC$1.00 MF$0.50
Institutt for Atomenergi, Kjeller (Norway).
FUNDAMENTALS OF THE CORROSION OF SUPER PURE ALUMINIUM IN WATER.
by Ketil Videm. Feb 66, 21p KR-88
Prepared for presentation at the International Congress of Metallic Corrosion (3rd), Moscow, May 16-26, 1966.

Descriptors: (*Corrosion, *Aluminum), Water, Oxides, Corrosion inhibition, Films, Coatings, Polarization, Anodic coatings, Voltage, Stability, Dielectric properties, Electric currents.

Corrosion rate and anodic polarisation curves were determined for super pure aluminium in continuously purified water. AC capacity of the exposed specimens and their behaviour under anodising (BARRIER LAYER DETERMINATION) were studied. The real barrier to corrosion appears to be a small fraction of the oxide film only, the so-called barrier layer. Provided the potential was above a certain value (ca. -1.8 volt on the hydrogen scale), the thickness of the barrier layer was proportional to the corrosion potential after an initial build-up period. The corrosion rate was in this case nearly unaffected by the potential. The ionic transport through the barrier layer could be expressed by I = A exp. BF, I is the corrosion rate, F the electrical field strength in the barrier oxide and A and B constants. Aluminium is passive without polarisation in pure water. The field strength in the barrier oxide was in this case determined to be about 6-7 M volt/cm. When cathodically polarised below about-1.8 volt, aluminium becomes active. The barrier oxide is unstable in water. In order to maintain a constant thickness, new oxide must continously form. After a certain induction period the destruction and the corresponding replenishment of the barrier layer is the only rate determining step in the corrosion of aluminium in pure water. (Author)

AD-478 481 See Field 20K

AD-638 749 See Field 13H

AD-638 782 See Field 20B

AD-638 976 See Field 20H

AD-639 160 See Field 14B

AD-639 314 See Field 13H

AD-639 340 See Field 20L

N66-24412 See Field 18J

N66-25034 See Field 13H

11G. MISCELLANEOUS MATERIALS

AD-639 341 **Field 11G, 11F**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
THE APPLICATION OF HEAT-INSULATION HONEYCOMB PLASTIC (SOTOPLAST).
by B. V. Lifanov. 21 Jun 66, 8p FTD-HT-66-248
TT-66-62320
Unedited rough draft trans. of Kholodilnaya Tekhnika (USSR), v41 n3 p45-7 1964.

Descriptors: (*Thermal insulation, Plastics), (*Plastics, Honeycomb cores), Thermal conductivity, Effectiveness, USSR.

AD-638 893 See Field 14E

AD-639 226 See Field 11B

AD-639 432 See Field 9A

AD-639 482 See Field 18H

11H. OILS, LUBRICANTS, AND HYDRAULIC FLUIDS

AD-638 800 **Field 11H**
CFSTI Prices: HC$1.00 MF$0.50
Army Weapons Command, Rock Island, Ill. Research and Engineering Div.
RADIOMETRIC STUDY OF THE WEAR CHARACTERISTICS OF DRY FILM LUBRICANTS.
Technical rept.
by Elizabeth A. Jennings, and Stanley L. Eisler. Aug 66, 15p
Proj. DA-1L013001A91A
RIA-66-2446

Descriptors: (*Lubricants, Films), (*Wear resistance, Lubricants), Radiography, Life expectancy, Molybdenum compounds, Sulfides, Phosphites, Antimony compounds, Oxides, Lead compounds.

The wear life of dry film lubricants as related to percent coating loss was studied by use of a radioactive tracer technique. The contribution to the total wear life by various combinations of the three basic ingredients--molybdenum disulfide, antimony trioxide, and dibasic lead phosphite was studied. Tests were run on a Falex Lubricant Tester to determine the percent coating loss of different formulations for various time periods. Percent coating loss was determined from counting rates of the pins, coated with tagged formulations, before and after testing. The test results indicated a linear relationship between percent coating loss and length of test. It was found that a prediction of the relative wear lives of different formulations could be made on the basis of the percent coating loss results, determined after one hour of testing.

N66-24870 **Field 11H, 13I**
CFSTI Prices HC$3.00 MF$0.75
Chalmers Univ. Of Technology, Goteborg (Sweden).
THE JOURNAL BEARING CONSIDERING VARIABLE VISCOSITY.
by B. Hakansson. 1964, 77p REPT.-25
Its Trans., No. 298

Descriptors: Analysis, Bearing, Computer, Equation, *Hydrodynamics, Journal, *Journal

bearing, Load, Lubricant, Numerical, *Numerical analysis, Oil, Performance, *Performance prediction, Prediction, Pressure, Program, Temperature, Test, Theory, Variable, *Viscosity.

For abstract, see S 04 13.

11I. PLASTICS

AD-409 097 **Field 11I, 13M, 13J, 1C**
CFSTI Price: HC$8.60
Aerojet-General Corp., Azusa, Calif.
RESIN SYSTEMS FOR FILAMENT WOUND PRESSURE HULL STRUCTURES.
Summary rept.
by I. Petker, and D. H. Eilfort. Apr 63, 82p Rept. no. 2534
Contract NObs-86307
Proj. SR-007-30-04
Task 1008

Descriptors: (*Thermosetting plastics, *Pressure vessels), Structures, Filament wound construction, Hull (Marine), Mechanical properties, Cylindrical bodies.

Test methods and results are presented for the mechanical properties of a variety of cast thermosetting resins. Data are given for compressive yield strength and modulus, block and Johnson shear strength, interlaminar shear strength, and tensile strength. The limiting strength of current resins appears to be about 25,000 psi in compression and 15,000 psi in tension. Results are also presented from a water permeability study of both resin castings and NOL rings. With proper selection of resins and adequate processing, it appears that negligible strength loss is sustained after one month at 5000 psi hydrostatic pressure. However, these tests were on non-load-bearing composites. The results from a wetting study which presents a practical method of determining the wetting factor of various resin systems are also given. Fabrication techniques, test methods, and a statistical analysis of the test results are presented for composite cylinders having 0.31-in. and 0.50-in. wall thicknesses which were hydrostatically burst under biaxial external pressure. The statistical correlation of cylinder data gives a strong evidence that the failure of thick-walled, filament-wound pressure vessels loaded externally is a shear-initiated mechanism. (Author)

AD-638 898 **Field 11I, 11D**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
POLYMERS WITH METAL PROPERTIES.
31 Aug 66, 4p FTD-HT-66-342
TT-66-62237
Unedited rough draft trans. from Ekonomicheskaya Gazeta (USSR) n33 (210) p38 18 Aug 1965.

Descriptors: (*Plastics, Additives), Composite materials, Polyethylene plastics, Nylon, Styrene plastics, Particles, Lead, Copper, Cadmium, Physical properties, USSR.

This thin elastic layer is provided with wonderful properties: it reliably protects against the action of x-rays. Chemists introduced into polyethylene the finest lead particles and in this attributed to it new qualities. Investigators created many 'hybrides' - polymeric substances, containing metal additions. From polystyrene, copper, caprone and cadmium, and also from other materials they synthesized complex substances, possessing greater thermal stability, high strength electroconductivity, and physical and chemical properties. When creating such 'hybrides' the scientists of the Institute of General and Inorganic Chemistry of the Academy of Sciences Ukr-SSR utilize chemical reactions, high temperature and even electrical current. A special apparatus was developed for this. The new materials are recommended by the scientists for application in intrament construction, electrical technology, and chemical industry. (Author) Document quoted in its entirety.

AD-639 062 **Field 11I, 11J, 14B**
CFSTI Prices: HC$2.00 MF$0.50
Naval Ordnance Lab., White Oak, Md.
DYNAMIC COMPRESSION TESTING OF SHOCK MITIGATING MATERIALS.
by James L. Rand, and William M. Hinckley. 9 Jan 66, 46p Ballistics Research-156, NOLTR-66-39

Descriptors: (*Plastics, Compressive properties), (*Rubber, Compressive properties), Stresses, Strain (Mechanics), Polymers, Thermoplastics, Thermosetting plastics, Dynamics, Graphics, Shock (Mechanics).

Dynamic stress strain relations have been obtained in compression at room temperature for a number of shock mitigating materials. The Hopkinson pressure bar technique has been used to obtain data at rates of strain from 370 in/in/sec to 13,750 in/in/sec. It has been observed that for many materials the effect of strain rate on stress for large values of strain can be measured to within 10 percent. Stress-strain relations which appear to be insensitive to changes in high strain rates have been observed in several materials. Experience has shown that rubber compositions cannot be tested by this method. (Author)

AD-639 381 **Field 11I**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Jamestown, R. I. Systems Research Field Lab.
BRIGHTNESS OF GREASE PENCIL MARKS ON A VERTICAL PLOTTING BOARD.
Memo rept.
by J. Gebhard, and K. V. Newton. 20 Jul 47, 14p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-23

Descriptors: (*Plotting boards, Brightness), Office equipment + supplies, Greases, Colors, Measurement, Plastics, Display systems.

The brightness of marked and unmarked positions on two vertical edge-lit plotting boards was measured with a Macbeth Illuminometer. One board was a Square Knock-down type at the Field Laboratory, the other was a Mark 4 Mod. 1 modified by the removal of the rear sheet of plastic. The upper seven-eighths of the boards was quite evenly illuminated. Near the base, about eight inches from the lights, there was a sharp rise in brightness. Marks placed at the bottom of the board were about five or six times brighter than those near the top. On the Square Knock-down board the marks were about five times as bright as those on the modified Mark 4 board examined. China-marking pencils in white and yellow produced marks about 50-60 times as bright as the unmarked board. Other colors were relatively very dim. More light was reflected upward from a mark than in any other direction. If both sheets received the same amount of light from the lamps, marks placed on the front and rear of the board were about equally bright. The brightness of the lines etched into the plastic was about the same as a yellow grease pencil mark. A heavily marked up board contributed little to general room illumination. Over the range of 100 to 120VAC a change of one volt across the lamps produced a change in the brightness of a mark of about 0.5 apparent foot candles. (Author)

AD-639 425 **Field 11I**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
STABILIZATION OF TEFLEX.
by M. Peterka. 6 Jun 66, 17p FTD-TT-65-1821
NCH-204 257
Unedited rough draft trans. of Chemicke Zvesti (Czechoslovakia) v17 p656-65 1963.

Descriptors: (*Halocarbon plastics, Stabilization), Additives, Bromine compounds, Potassium compounds, Nitrites, Sodium compounds, Casting, Extrusion, Viscosity, Thermal stability, Mechanical properties, Electrical properties, Czechoslovakia.

Identifiers: Polytrifluoro chloro ethylenes, Potassium bromate, Sodium nitrite.

The stabilization of teflex (a poly (fluorochloro ethylene) of Czechoslovakian manufacture) was checked in practice during the processing of the polymer with an extruder and casting under pressure. Especially constructed melting furnaces were used for the processing. The addition of the system bromate-nitric acid permitted the processing teflex by casting under pressure to a temperature of 300 - 340C. At that temperature the viscosity of the melt is sufficiently low, and it is possible to obtain formed pressed objects in weights of up to 120 kg. Mechanical properties of stamped objects were in all cases better than for unstabilized teflex, and dehydration of the polymer during the processing was much lower. Addition of stabilizers does not deteriorate the electrical properties of teflex, which are identical with foreign samples of polytrifluorochloroethyl
ene. (Author)

AD-639 442 **Field 11I, 7C**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
HETEROPOLYCONDENSATION OF ACETYL FERROCENE WITH CARBAMIDE.
by I. A. Golubeva, and T. P. Vishnyakova. 11 Aug 66, 8p FTD-HT-66-474
TT-66-62340
Unedited rough draft trans. of Plasticheskie Massy (USSR) n12 p10-2 1965.

Descriptors: (*Heat-resistant plastics, Ferrocenes), (*Ferrocenes, Condensation reactions), (*Ureides, Condensation reactions), Polymerization, Molecular structure, Electrical properties.

The heteropolycondensation of acetyl ferrocene with carbamide yielded a dark infusible powder which proved to be a polyconjugate system with the elemental composition C13H12N2Fe, to have a molecular weight of about 1000, and which decomposed at approx. 350C. The dependence of conductivity of the polymer upon temperature was found to be exponetial in the interval 20 to 300C; its specific conductivity was 0.00000047/ohm/cm.

AD-639 492 **Field 11I**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
HYDROPHOBIZED POWDERS FOR FILLING POLYETHER AND EPOXY RESINS.
by O. O. Pashchenko, and R. V. Serbina. 28 Jun 66, 8p FTD-HT-66-78
TT-66-62354
Unedited rough draft trans. of Khimichna Promyslovist' (USSR) n4 p7-8 1964.

Descriptors: (*Surface-active substances, Plastics), (*Plastics, Additives), (*Epoxy plastics, Additives), Minerals, Slioxanes, Powders, Ethers, Polymers, Moisture, Sorption, Mechanical properties, USSR.

Identifiers: Fillers, Polyethers, Polyethylsiloxanes.

The modification of mineral fillers with polyethyl hydrosiloxane is reported. A description is given of a method for preparing such fillers, and of their effects on the properties of polyether and epoxy plastics.

AD-639 575 **Field 11I, 7D, 20C**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
MAGNETIC PROPERTIES OF POLYMERS CONTAINING FERROCENE.

by P. M. Belash, and Ya. M. Paushkin. 21 Jun 66, 13p FTD-TT-65-2043
TT-66-62365
Unedited rough draft trans. of Institut Neftekhimicheskoi i Gazovoi Promyshlennosti. Trudy (USSR) n51 p48-53 1964.

Descriptors: (*Ferrocenes, Polymers), (*Polymers, Magnetic properties), Paramagnetic resonance, Nuclear magnetic resonance, Magnetic fields, Ferromagnetism, USSR.

Ferrocene was copolymerized with alpha-bromonaphthalene and with n-dichlorobenzene, and the electron paramagnetic resonance and magnetic properties of the resulting substances were examined. Possible reasons for the observed ferromagnetism are discussed.

AD-639 581 **Field 11I, 7C**
CFSTI Prices: HC$1.00 MF$0.50
Naval Air Engineering Center, Philadelphia, Pa. Aeronautical Materials Lab.
PRELIMINARY RESEARCH ON POLYURETHANE LAMINATING SYSTEMS HAVING GOOD THERMAL AND MECHANICAL PROPERTIES.
Progress rept.
by H. J. Lee. 2 Aug 66, 10p NAEC-AML-2492
See also AD-466 993.

Descriptors: (*Laminated plastics, Mechanical properties), (*Isocyanate plastics, Thermal properties), (*Heat-resistant plastics, Isocyanate plastics), Polymers, Reaction kinetics, Complex compounds, Synthesis (Chemistry).

The continuing studies on polyurethane systems for laminates of highly advantageous themal and mechanical capabilities is discussed. Polymers possessing some properties superior to prervious systems synthesized were investigated. (Author)

N66-24981 **Field 11I**
CFSTI Prices HC$1.00 MF$0.50
National Bureau Of Standards, Washington, D. C.
POLYMER DECOMPOSITION INITIATED BY HIGH ENERGY RADIATION PROGRESS REPORT, NOV. 1965 - MAY 1966.
by L. A. Wall. Apr 66, 10p NASA-CR-74662
NASA ORDER R-56

Descriptors: Chemistry, *Decomposition, Depolymerization, Effect, Gamma, High energy, Polymer, *Polymer chemistry, Polytetrafluoroethylene, Radiation, *Radiation effect, Thermal.

For abstract, see S 04 13.

N66-24984 **Field 11I**
CFSTI Prices HC$1.00 MF$0.50
Stanford Research Inst., Menlo Park, Calif.
POLYMERS FOR SPACECRAFT HARDWARE MATERIALS SPECIFICATIONS AND ENGINEERING INFORMATION MONTHLY TECHNICAL PROGRESS REPORT NO. 18, NOV. 10 - DEC. 9, 1965.
by N. Fishman, R. F. Muraca, H. G. Thomas, and J. S. Whittick. 15 Dec 65, 15p NASA-CR-74666
Contracts NAS7-100, JPL-950745
Prepared For Jpl

Descriptors: Analysis, Chemical, *Chemical analysis, Chemistry, Compound, Construction, Material, Polymer, *Polymer chemistry, Potting, *Potting compound, Silicone, Spacecraft, *Spacecraft construction material.

For abstract, see S 04 13.

N66-24985 **Field 11I**
CFSTI Prices HC$1.00 MF$0.50
Stanford Research Inst., Menlo Park, Calif.
POLYMERS FOR SPACECRAFT HARDWARE - MATERIALS SPECIFICATIONS AND ENGINEERING INFORMATION MONTHLY TECHNICAL PROGRESS REPORT NO. 17, OCT. 10 - NOV. 9, 1965.
by N. Fishman, R. F. Muraca, H. G. Thomas, and J. S. Whittick. 15 Nov 65, 16p NASA-CR-74665
Contracts NAS7-100, JPL-950745
Prepared For Jpl

Descriptors: Chemistry, Coating, Construction, Loss, Material, Mechanical, Polymer, *Polymer chemistry, *Polyurethane, Property, Spacecraft, *Spacecraft construction material, Thermal, Vacuum, Weight.

For abstract, see S 04 13.

N66-25487 **Field 11I, 7E**
CFSTI Prices HC$1.00 MF$0.50
Polish Academy Of Sciences, Warsaw.
HYDROFOBIZATION OF CELLULOSE BY RADIATION INDUCED GRAFTING OF STYRENE ON ITS SURFACE.
Hydrofobizacja Celulozy Metoda Radiacyjnego Szczepienia Styrenu Na Jej Powierzchni
by Z. Bulhak, and W. Zielinski. 1965, 19p
REPT.-671/XVII/C
In Polish, English Summary

Descriptors: Alcohol, Atmosphere, *Cellulose, Chemical, *Chemical effect, Chloroform, Dioxane, Effect, Fiber, *Fiber strength, Gas, Grafting, Graph, Liquid, Monomer, Nitrogen, Radiation, Solution, Strength, *Styrene, Surface, Tensile, Vapor, Water, *Waterproofing.

For abstract, see S 04 14.

N66-26818 **Field 11I**
CFSTI Prices HC$1.00 MF$0.50
Stanford Research Inst., Menlo Park, Calif.
DEVELOPMENT OF MATERIAL SPECIFICATIONS AND QUALIFICATIONS OF POLYMERIC MATERIALS FOR THE JPL SPACECRAFT MATERIALS GUIDEBOOK MONTHLY TECHNICAL PROGRESS REPORT NO. 11, 10 APR. - 10 MAY 1965.
by D. J. Lyman. 15 May 65, 9p NASA-CR-75297
Contracts NAS7-100, JPL-950745
Prepared For Jpl

Descriptors: Characteristic, Compound, *Curing, Effect, Liquid, Outgassing, Paste, *Polymer, Potting, *Potting compound, Procedure, *Silicone.

For abstract, see S 04 14.

N66-34670 **Field 11I**
CFSTI Prices HC$2.00 MF$0.50
Harris Research Labs., Inc., Washington, D. C.
THE REINFORCEMENT OF POLYMERIC STRUCTURES BY ASBESTOS FIBRILS FINAL REPORT, 1 APR. 1965 - 30 APR. 1966.
by A. E. Davis, C. A. Rader, and A. M. Schwartz. 1966, 36p NASA-CR-77225
Contract NASW-1183

Descriptors: *Asbestos, Composite, Data, *Dispersion, Fiber, Macroscopy, Matrix, *Polymer, Reinforcement, *Reinforcing fiber, Strength, Structure, Tensile, *Tensile strength, Ultimate.

For abstract, see S 04 20.

N66-34935 **Field 11I**
CFSTI Prices HC$3.75 MF$1.25
Trw Systems, Redondo Beach, Calif.
INVESTIGATION OF RESIN SYSTEMS FOR IMPROVED ABLATIVE MATERIALS FINAL REPORT, 19 JUN. 1964 - 31 JUL. 1965.
by E. A. Burns, B. Dubrow, and H. R. Lubowitz. 1 Apr 66, 219p NASA-CR-54471, TRW-4176-6014-SO-000
Contract NAS3-4188

Descriptors: *Ablating material, Ablation, Fluorine, Liquid, *Liquid propellant, Material, Matrix, Polymer, Propellant, Property, *Resin, Synthesis, System, Thermochemistry, Thermophysical.

For abstract, see S 04 20.

N66-35317 **Field 11I**
CFSTI Prices HC$1.00 MF$0.50
Rensselaer Polytechnic Inst., Troy, N. Y.
SEEDING OF SUPERCOOLED POLYETHYLENE WITH EXTENDED CHAIN CRYSTALS.
by C. M. Cormier, and B. Wunderlich. 1965, 24p NASA-CR-68621
Grant NSG-100
Submitted For Publication

Descriptors: Calorimeter, Chain, Crystal, *Crystal growth, Crystallization, Differential, Growth, *Polyethylene, Polymer, Scanning, Seeding, *Supercooling, Xylene.

For abstract, see S 04 20.

AD-638 715 **See Field 7D**

AD-638 860 **See Field 7C**

AD-638 861 **See Field 7C**

AD-638 921 **See Field 11D**

AD-638 922 **See Field 11D**

AD-638 975 **See Field 7C**

AD-639 139 **See Field 7C**

AD-639 221 **See Field 20K**

AD-639 319 **See Field 1C**

AD-639 341 **See Field 11G**

AD-639 356 **See Field 11D**

AD-639 439 **See Field 11C**

AD-639 460 **See Field 11E**

AD-639 617 **See Field 11D**

11J. RUBBERS

AD-638 995 **Field 11J, 7D**
Not available from CFSTI.
Duke Univ., Durham, N. C. Dept. of Chemistry.
EFFECT OF STRAIN ON THE THERMODYNAMIC MELTING TEMPERATURE OF POLYMERS.
by W. R. Krigbaum, J. V. Dawkins, G. H. Via, and Y. I. Balta. 6 Oct 65, 15p
Grants DA-ARO (D)-31-124-G580, PHS-GM-09767
AROD-3222:6
Availability: Published in Journal of Polymer Science v4 ptA-2 p475-89 1966.

Descriptors: (*Polymers, Strain (Mechanics)), (*Chloroprenes, Melting point), (*Rubber, Melting point), Vulcanizates, Thermodynamics, Transition temperature, Deformation, Crystallization, Molecular association, X-ray diffraction analysis, Ultrasonic radiation, Refraction.

X-ray diffraction, sonic velocity, and birefringence measurements were used to study the variation of the apparent melting point of strained natural rubber and polychloroprene vulcanizates with elongation ratio and crystallization temperature. The procedure of Hoffman and Weeks was employed to obtain the thermodynamic melting point, tm, for each elongation ratio, alpha. The parameter beta relating to the distribution of fold lengths is unusually large for low elongation ratios and de-

creases into the usual range only at higher elongations. The observed variations of tm with alpha for these two polymers are compared with the theoretical predictions of Flory and Roe and Krigbaum. Although the predictions of the Flory theory depend somewhat upon the value assigned for the number of repeating units per statistical link, and this parameter is not well known for polychloroprene, it is nevertheless concluded that his treatment offers a better representation of the melting point elevation for high elongations. Due to the approximations introduced, the treatment of Flory is not valid for lower elongations. Any attempt to improve this treatment must begin by specifying the free energy of the semicrystalline system, which implies a knowledge of the distribution of crystallite orientations and how this distribution varies with strain and with the crystallization conditions. (Author)

N66-24972 **Field 11J**
CFSTI Prices HC$1.00 MF$0.50
Stanford Research Inst., Menlo Park, Calif.
POLYMERS FOR SPACECRAFT HARDWARE MATERIALS SPECIFICATIONS AND ENGINEERING INFORMATION MONTHLY TECHNICAL PROGRESS REPORT NO. 21, FEB. 10 - MAR. 9, 1966.
by N. Fishman, R. F. Muraca, H. G. Thomas, and J. S. Whittick. 15 Mar 66, 21p NASA-CR-74688
Contracts NAS7-100, JPL-950745
Prepared For Jpl

Descriptors: Analysis, Base, Chemical, Chemistry, Compound, Construction, Density, Material, Polymer, *Polymer chemistry, Potting, *Potting compound, Silicone, Spacecraft, *Spacecraft construction material.

For abstract, see S 04 13.

N66-24980 **Field 11J**
CFSTI Prices HC$4.00 MF$0.75
Stanford Research Inst., Menlo Park, Calif.
POLYMERS FOR SPACECRAFT HARDWARE - MATERIALS SPECIFICATIONS AND ENGINEERING INFORMATION INTERIM REPORT NO. 2, AUG. 1965 - MAR. 1966.
15 Mar 66, 105p NASA-CR-74657
Contracts NAS7-100, JPL-950745
Prepared For Jpl

Descriptors: Chemical, *Chemical property, Construction, Loss, Material, Method, Physical, *Physical property, *Polymer, Property, Spacecraft, *Spacecraft construction material, Test, Thermal, Vacuum, Weight.

For abstract, see S 04 13.

N66-24982 **Field 11J**
CFSTI Prices HC$1.00 MF$0.50
Stanford Research Inst., Menlo Park, Calif.
POLYMERS FOR SPACECRAFT HARDWARE MATERIALS SPECIFICATIONS AND ENGINEERING INFORMATION MONTHLY TECHNICAL PROGRESS REPORT NO. 19, DEC. 10, 1965 - JAN. 9, 1966.
by N. Fishman, R. F. Muraca, H. G. Thomas, and J. S. Whittick. 15 Jan 66, 24p NASA-CR-74664
Contracts NAS7-100, JPL-950745
Prepared For Jpl

Descriptors: Chemistry, Construction, Loss, Material, *Material testing, Polymer, *Polymer chemistry, Spacecraft, *Spacecraft construction material, Testing, Thermal, Vacuum, Weight.

For abstract, see S 04 13.

N66-34686 **Field 11J**
CFSTI Prices HC$1.00 MF$0.50
Stanford Research Inst., Menlo Park, Calif.
STUDY OF BONDING BETWEEN GLASS AND PLASTIC IN GLASS-REINFORCED PLASTICS - EXTENDED WORK QUARTERLY PROGRESS REPORT NO. VII, 1 APR. - 30 JUN. 1966.
by D. L. Chamberlain Jr. 31 Jul 66, 7p NASA-CR-77384
Contract NASR-49/14/
Its Rept.-9

Descriptors: *Bonding, Butyl, Cleaning, Composite, *Composite material, Dioxide, Effect, Energy, Free, Glass, Material, Plastic, *Reinforced plastic, Reinforcement, *Silica glass, Silicon, Surface.

For abstract, see S 04 20.

AD-639 062 **See Field 11I**

AD-639 389 **See Field 7E**

11L. WOOD AND PAPER PRODUCTS

CS-259-63 **Field 11L**
CFSTI Price: HC$0.15
National Bureau of Standards, Washington, D. C. Office of Product Standards.
SOUTHERN PINE PLYWOOD.
1966, 18p
A recorded voluntary standard of the trade published by the U. S. Department of Commerce. Prepared in cooperation with Forest Service, Washington, D. C. Forest Products Lab.

Descriptors: (*Plywood, Standards), Commerce.

PB-170 706 **Field 11L**
CFSTI Prices: HC$1.60 MF$0.50
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia). Div. of Forest Products.
LABORATORY EVALUATION OF THE DURABILITY OF BRIGALOW (F. MUELL.) HEARTWOOD.
Technological paper.
by E. W. B. Da Costa, and F. J. Gay. 26 Jan 66, 13p TP-42

Descriptors: (*Wood, Degradation), Trees, Fungus deterioration, Isoptera, Preservation, Australia.

Identifiers: Acacia harpophylla.

Although large quantities of round brigalow fence posts could readily be obtained in areas where the trees are being cleared for agriculture, this wood is not used because of its reputedly low durability. Laboratory bio-assays, in which brigalow was compared with timbers of known durability, showed that the heartwood of brigalow was reasonably resistant to the decay fungi Coniophora olivacea, Lenzites trabea, Pycnoporus coccineus, and Fomes lividus and highly resistant to the subterranean termites Coptotermes acinaciformis, C. lacteus, and Nasutitermes exitiosus. It is concluded that large brigalow posts should give a satisfactory service life but that preservative impregnation of the non-durable sapwood should be carried out wherever possible. (Author)

PB-170 830 **Field 11L**
CFSTI Prices: HC$2.00 MF$0.50
Forest Products Lab., Madison, Wis.
SORPTION AND SWELLING CHARACTERISTICS OF SALT-TREATED WOOD.
Research paper.
by B. A. Bendtsen. May 66, 47p FPL-60

Descriptors: (*Wood, Impregnation), Salts, Inorganic compounds, Protective treatments, Sorption, Deformation, Degradation.

Seven inorganic salts, commonly used in the impregnation of wood, were investigated in terms of their effect on the sorption and swelling characteristics of ponderosa pine and red oak in a range of relative humidities normally encountered in service. Swelling was, without exception, greater in chemically treated wood than in matching specimens of untreated wood. Only sodium chloride showed an appreciable effect on the dimensional stability of the two species as measured by volumetric shrinkage and swelling. However, treatment with the various chemicals increased the anisotropic swelling characteristics of both species. Equilibrium moisture content values were substantially increased by treatments with ammonium sulfate, sodium chloride, and zinc chloride. For these salts, equilibrium moisture content was a consistent linear function of the salt-wood weight ratio. Treatment with two phosphate salts had no apparent effect on equilibrium moisture content, while treatment with borax and boric acid caused increases in moisture content that are not considered permanent. (Author)

PB-170 831 **Field 11L**
CFSTI Prices: HC$3.00 MF$0.50
Forest Products Lab., Madison, Wis.
HARDWOOD LOG GRADES FOR STANDARD LUMBER.
Research paper.
by C. L. Vaughan, and A. C. Wollin. Jun 66, 55p FPL-63
FPL-1737 superseded.

Descriptors: (*Wood, Specifications), Standardization, Analysis, Tables.

The official U.S. Forest Service Hardwood Log Grades for Standard Lumber are described and tables of expected yields of standard factory grade lumber are presented by species, log grade, and log diameter. With this information, foresters, timber sellers, and timber buyers can separate, from woods-run hardwood logs, those logs suitable for manufacture into standard factory grade lumber. Furthermore, the logs can be ranked into categories of high, medium, and low value and lumber grade yields. The yield tables provide the information to estimate the lumber grade yields to be expected from the graded logs. (Author)

PB-172 421 **See Field 11C**

PB-173 105 **See Field 5I**

12. MATHEMATICAL SCIENCES

N66-25496 **Field 12**
CFSTI Prices HC$3.00 MF$0.50
Technisch Documentatie En Informatie Centrum Voor De Krijgsmacht, The Hague (Netherlands).
OPERATIONS RESEARCH VI TITLE INDEX.
Operations Research Vi Titel-index
1965, 54p TDCK-43746
In Dutch And English

Descriptors: Control, Distribution, Effect, Game, *Game theory, Index, Information, *Information theory, Inventory, Logistics, Medicine, Netherlands, Optimum, *Programming, Quality, *Quality control, Subject, System, Theory, Transportation, Weapon, *Weapon system.

For abstract, see S 04 14.

12A. MATHEMATICS AND STATISTICS

AD-638 709 **Field 12A**
Not available from CFSTI.
Harvard Univ., Cambridge, Mass.
INVESTIGATION ON GROUPS OF EVEN ORDER, II.
by Richard Brauer. 1 Dec 65, 9p
Contract AF 49 (638)-1381
Proj. AF-9749
Task 974902
AFOSR-66-1353
Availability: Published in Proceedings of the National Academy of Sciences v55 n2 p254-9 Feb 1966.

Descriptors: (*Groups (Mathematics), Theory).

The paper studies finite groups G which possess P as their p-Sylow subgroup, and follows two earlier papers in which (1) results concerning the irreducible characters of G were obtained and (2) examined additional methods for p=2. The nature of the results depends strongly on the structure on P. At least for certain P, an amazing amount can be said about G in the case p=2. Elsewhere, the cases of quaternion dihedral, quasidihedral P have been investigated and at least partial results have been obtained for abelian P. This paper reports on some further results of this nature. (Author)

AD-638 712 **Field 12A**
Not available from CFSTI.
Harvard Univ., Cambridge, Mass. Dept. of Mathematics.
ON THE DEGREE OF CONVERGENCE OF EXTREMAL POLYNOMIALS AND OTHER EXTREMAL FUNCTIONS.
by J. L. Walsh, and A. Sinclair. 4 Jun 63, 19p
Contract AF 49 (638)-1591
Proj. AF-9749
Task 974902
AFOSR-66-1513
Revision of manuscript submitted 23 Mar 60.
Availability: Published in Transactions of the American Mathematical Society v115 issue3 p145-60 Mar 1965.

Descriptors: (*Polynomials, *Approximation (Mathematics)), (*Functions, Sequences), Topology.

AD-638 730 **Field 12A**
CFSTI Prices: HC$3.00 MF$0.75
Cornell Univ., Ithaca, N. Y. Dept. of Industrial Engineering and Operations Research.
SOME EXTENSIONS OF SOMERVILLE'S PROCEDURE FOR RANKING MEANS OF NORMAL POPULATIONS.
Technical rept.
by William R. Fairweather. Jul 66, 82p TR-9
Contract Nonr-401 (53)
Proj. NR-042-244

Descriptors: (*Statistical analysis, Sequential analysis), Sampling, Decision theory, Optimization.

Identifiers: Somerville's procedure.

In an article in Biometrika Vol. 41 (1954), Somerville proposed a one-stage and a two-stage procedure (which eliminates one population after the first stage) for selecting the population with the largest mean from a set of normal populations with unknown means and a common, known variance. He assumed that a certain loss was incurred on making an incorrect selection and also assumed a sampling cost. He showed numerically, for the special case of three populations, that the two-stage procedure, when using appropriate allocations of observations between stages, has a smaller maximum expected loss (maximum over the possible configuration of the true population means) than does the one-stage procedure. In this paper the formulation of Somerville's two-stage procedure is extended to arbitrary numbers of populations, and the procedures are studied numerically for the case of four populations. For this case, two 2-stage procedures are possible (eliminating either one or two populations after the first stage) and it is found that both two-stage procedures, using appropriate allocations, have smaller maximum expected losses than does the corresponding one-stage procedure, but which two-stage procedure is the better depends on the allocation. Methods of extending the formulation to multi-stage procedures are also considered. Numerical studies, which are undertaken require the evaluation of 5- variate normal integrals with arbitrary correlation coefficients and limits of integration. This is accomplished using a method suggested by Plackett in Biometrika Vol. 41 (1954). (Author)

AD-638 763 **Field 12A**
Not available from CFSTI.
Courant Inst. of Mathematical Sciences, New York Univ., N. Y.
ASYMPTOTIC SOLUTION OF HYPERBOLIC SYSTEMS WITH CONSTANT COEFFICIENTS.
by B. Granoff, and R. M. Lewis. 27 Jan 64, 14p
Contract Nonr-285 (48)
Availability: Published in J. Inst. Maths Applics v2 p144-56 1966.

Descriptors: (*Partial differential equations, *Asymptotic series), Integral transforms, Functions.

AD-638 777 **Field 12A**
Not available from CFSTI.
Harvard Univ., Cambridge. Dept. of Statistics.
NEW METHODS FOR REASONING TOWARDS POSTERIOR DISTRIBUTIONS BASED ON SAMPLE DATA.
Technical rept.
by A. P. Dempster. 8 Oct 65, 23p TR-8
Contract Nonr-1866 (37)
Proj. NR-042-097
Revision of manuscript submitted 30 Jun 64.
Availability: Published in The Annals of Mathematical Statistics v37 n2 p355-74 Apr 1966.

Descriptors: (*Sampling, *Statistical distributions), Probability, Decision theory.

The paper redefines the concept of sampling from a population with a given parametric form, and thus leads up to some proposed alternatives to the existing Bayesian and fiducial arguments for deriving posterior distributions. A novel property of these inferences is that they generally assign upper and lower probabilities to events concerning unknowns rather than precise probabilities as given by Bayesian or fiducial arguments. (Author)

AD-638 796 **Field 12A**
CFSTI Prices: HC$3.00 MF$0.50
Stanford Univ., Calif. Dept. of Computer Science.
ACCURATE EIGENVALUES OF A SYMMETRIC TRI-DIAGONAL MATRIX.
Techanical rept.
by W. Kahan. 22 Jul 66, 57p CS-41
Contract Nonr-225 (37)
Proj. NR-044-211
Prepared in cooperation with Toronto Univ. (Ontario). Depts. of Computer Science and Mathematics.

Descriptors: (*Matrix algebra, *Algorithms), Errors.

Identifiers: Eigenvalues.

Having established tight bounds for the quotient of two different lub-norms of the same tri-diagonal matrix J, the author observes that these bounds could be of use in an error-analysis provided a suitable algorithm were found. Such an algorithm is exhibited, and its errors are thoroughly accounted for, including the effects of scaling, over/underflow and roundoff. A typical result is that, on a computer using rounded floating point binary arithmetic, the biggest eigenvalue of J can be computed easily to within 2.5 units in its last place, and the smaller eigenvalues will suffer absolute errors which are no larger. These results are somewhat stronger than had been known before. (Author)

AD-638 797 **Field 12A**
CFSTI Prices: HC$1.00 MF$0.50
Stanford Univ., Calif. Dept. of Computer Science.
WHEN TO NEGLECT OFF-DIAGONAL ELEMENTS OF SYMMETRIC MATRICES.
Technical rept.
by W. Kahan. 25 Jul 66, 13p CS-42
Contract Nonr-225 (37)
Proj. NR-044-211
Prepared in cooperation with Toronto Univ. (Ontario). Depts. of Computer Science and Mathematics.

Descriptors: (*Matrix algebra, Iterative methods), Theory.

Given a tolerance E>O, the author seeks a criterion by which an off-diagonal element of the symmetric tri-diagonal matrix J may be deleted without changing any eigenvalue of J by more than E. The criterion obtained permits the deletion of elements of order square root of E under favorable circumstances, without requiring any prior knowledge about the separation between the eigenvalues of J. (Author)

AD-638 798 **Field 12A, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Stanford Univ., Calif. Dept. of Computer Science.
TWO WORKING ALGORITHMS FOR THE EIGENVALUES OF A SYMMETRIC TRIDIAGONAL MATRIX.
Technical rept.
by W. Kahan, and J. Varah. 1 Aug 66, 32p CS-43
Contract Nonr-225 (37)
Proj. NR-044-211
Prepared in cooperation with Toronto Univ. (Ontario). Dept. of Mathematics.

Descriptors: (*Algorithms, *Matrix algebra), (*Programming (Computers), Matrix algebra), Iterative methods.

Identifiers: Eigenvalues.

Two tested programs are supplied to find the eigenvalues of a symmetric tridiagonal matrix. One program uses a square-root-free version of the QR algorithm. The other uses a compact kind of Sturm sequence algorithm. These programs are faster and more accurate than the other comparable programs published previously with which they have been compared. (Author)

AD-638 799 **Field 12A**
CFSTI Prices: HC$2.00 MF$0.50
Stanford Univ., Calif. Dept. of Computer Science.
RELAXATION METHODS FOR SEMI-DEFINITE SYSTEMS.
Technical rept.
by W. Kahan. 9 Aug 66, 35p CS-45
Contract Nonr-225 (37)
Proj. NR-044-211
Prepared in cooperation with Toronto Univ. (Ontario). Depts. of Computer Science and Mathematics.

Descriptors: (*Iterative methods, *Matrix algebra), Equations.

Certain non-stationary relaxation iterations, which are commonly applied to positive definite symmetric systems of linear equations, are also applicable to a semi-definite system provided that system is consistent. Some of the convergence theory of the former application is herein extended to the latter application. The effects of rounding errors and of inconsistency are discussed too, but with few helpful conclusions. Finally, the application of these relaxation iterations to an indefinite system is shown here to be ill-advised because these iterations will almost certainly diverge exponentially. (Author)

AD-638 806 **Field 12A**
CFSTI Prices: HC$1.00 MF$0.50
Army Electronics Command, Fort Monmouth, N. J.
SINGLE DEGREE OF FREEDOM ORTHOGONAL COMPONENTS OF A FACTOR AT 2K LEVELS IN TERMS OF LINEAR COMBINATIONS OF THE 2K CONTRASTS OF K FACTORS AT 2 LEVELS.
Technical rept.
by Joseph Weinstein. Aug 66, 13p ECOM-2741
Proj. DA-9030-00-400-00

Descriptors: (*Experimental design, *Factor analysis), (*Combinatorial analysis, Algorithms), Matrix algebra.

A computational procedure is developed which extends the use of Yates algorithm (for contrasts of two-level factors in an experimental design) to factors at 2k levels. By use of K dummy factors at two levels, the 2k levels of an experimental factor are represented as treatment combinations of the dummy variables. The components of the experimental factor are then related to linear combinations of the contrasts of the K dummy factors at two levels. The dependence of the linear combination on the original assignment of treatment combinations of the dummy factors is illustrated for two assignments for K = 2. (Author)

AD-638 809 **Field 12A**
CFSTI Prices: HC$3.00 MF$0.50
Stanford Univ., Calif. Dept. of Computer Science.
TODAY'S COMPUTATIONAL METHODS OF LINEAR ALGEBRA.
Technical rept.
by George E. Forsythe. 11 Aug 66, 51p CS-46
Contract Nonr-225 (37)
Proj. NR-044-211
Prepared for presentation at a national meeting of SIAM at Iowa City, Iowa, 13 May 66.

Descriptors: (*Matrix algebra, *Algorithms), Real numbers, Equations, Programming (Computers).

This is a survey of selected computational aspects of linear algebra, addressed to the nonspecialist in numerical analysis. Some current methods of solving systems of linear equations, and computing eigenvalues of symmetric and unsymmetric matrices are outlined. A bibliography containing 62 titles is included. (Author)

AD-638 818 **Field 12A**
CFSTI Prices: HC$2.00 MF$0.50
Stanford Univ., Calif. Dept. of Computer Science.
RELAXATION METHODS FOR AN EIGEN-PROBLEM.
Technical rept.
by W. Kahan. 8 Aug 66, 37p CS-44
Contract Nonr-225 (37)
Proj. NR-044-211

Descriptors: (*Iterative methods, *Matrix algebra), Theory.

A theory is developed to account for the convergence properties of certain relaxation iterations which have been widely used to solve an eigenproblem with large symmetric matrices A and B and positive definite B. These iterations always converge, and almost always converge to the right answer. Asympootically, the theory is essentially that of the relaxation iteration applied to a semi-definite linear system discussed in a previous report (AD-638 799). (Author).

AD-638 820 **Field 12A**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md.
ON SOME NON-LINEAR ELLIPTIC DIFFERENTIAL-FUNCTIONAL EQUATIONS.
by Philip Hartman, and Guido Stampacchia. 1966, 44p
Contract AF 49 (638)-1382
Proj. AF-9749
Task 974902
AFOSR-66-0762
Prepared in cooperation with Pisa Univ. (Italy).
Grant AF-EOAR-42-65.
Availability: Published in Acta Mathematica v115 p271-310 1966.

Descriptors: (*Nonlinear differential equations, *Boundary value problems), Functional analysis, Equations, Theorems.

The paper obtains existence and uniqueness theorems for (weak) uniformly Lipschitz continuous solutions u (x) of Dirichlet boundary value problems associated with non-linear elliptic differential-functional equations.

AD-638 832 **Field 12A**
Not available from CFSTI.
Harvard Univ., Cambridge, Mass. Dept. of Mathematics.
ON FINITE DESARGUESIAN PLANES. II.
by Richard Brauer. 24 Jul 65, 31p
Contract AF 49 (638)-1381
Proj. AF-9749
Task 974902
AFOSR-66-1406
Availability: Published in Math. Zeitschrift v91 p124-51 (1966).

Descriptors: (*Projective geometry, Theory), Groups (Mathematics).

The paper concerns characterizations of the projective group PGL (3,q) of a finite Desarguesian plane of order q by means of properties of the centralizers of involutions, in particular the case q is congruent to -1 (mod 4). The case q is congruent to 1 (mod 4) will be treated in a subsequent paper. The case of an even q has already been dealt with by Suzuki.

AD-638 834 **Field 12A**
Not available from CFSTI.
Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
THE RAPIDITY OF CONVERGENCE OF THE HERMITE-FEJER APPROXIMATION TO FUNCTIONS OF ONE OR SEVERAL VARIABLES.
by O. Shisha, and B. Mond. 18 Nov 64, 12p
ARL-66-0125
Proj. AF-7071
Prepared for presentation at The American Mathematical Society Apr 13, 1965.
Availability: Published in Proceedings of the American Mathematical Society v16 n6 p1269-76 Dec 1965.

Descriptors: (*Polynomials, *Approximation (Mathematics)), (*Functions, Approximation (Mathematics)), Sequences.

Identifiers: Hermite-Fejer approximation.

AD-638 835 **Field 12A, 4B**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md. Dept. of Statistics.
OPTIMAL ESTIMATION OF INITIAL CONDITIONS FOR NUMERICAL PREDICTION.
Revised ed.
by Richard H. Jones. 9 Jul 65, 10p
Contract AF 49 (638)-1302
Proj. AF-9749
Task 974902
AFOSR-66-0221
Revision of manuscript submitted 1 Sep 64.
Availability: Published in Journal of the Atmospheric Sciences v22 n6 p658-63 Nov 1965.

Descriptors: (*Mathematical prediction, *Weather forecasting), Numerical analysis, Statistical analysis, Optimization.

A numerical-statistical forecasting method is presented in which statistical techniques are used on the errors of numerical predictions. This, in effect, uses earlier numerical predictions to obtain best estimates of the initial conditions. A technique is given whereby the method can be applied by estimating the necessary parameters, and it is shown that this procedure converges to the optimal estimate. (Author)

AD-638 846 **Field 12A**
Not available from CFSTI.
RAND Corp., Santa Monica, Calif.
AN APPLICATION OF THE MULTIPLE CORRELATION COEFFICIENT IN THE REDUCTION OF VARIATES.
by Alan J. Gross. Sep 66, 10p P-3444
Availability: Published in Journal of American Statistical Association p1-9.

Descriptors: (*Statistical functions, *Multivariate analysis), Biometry, Analysis.

The author considers a population of individuals upon whom measurements are made in k different categories. The total score of an individual is then taken to be the sum of the measurements in each category. As k is usually a large (or relatively large) number, a method employing the multiple correlation coefficient, is derived which seeks out those categories among the original k categories which can be used to predict the score or response of an individual who is yet to undergo the test. (Author)

AD-638 847 **Field 12A**
Not available from CFSTI.
RAND Corp., Santa Monica, Calif.
ON PRODUCTS OF FINITE DIMENSIONAL STOCHASTIC MATRICES.
by M. P. Schutzenberger. Aug 66, 11p P-3439
Availability: Published in Proceedings of American Mathematical Society p1-10.

Descriptors: (*Matrix algebra, Stochastic processes), Combinatorial analysis, Monoids.

AD-638 915 **Field 12A**
Not available from CFSTI.
Harvard Univ., Cambridge, Mass. Dept. of Mathematics.
THE CONVERGENCE OF SEQUENCES OF RATIONAL FUNCTIONS OF BEST APPROXIMATION. II.
Interim rept.
by J. L. Walsh. 30 Mar 64, 14p
Contract AF 49 (638)-1591
Proj. AF-9749
Task 974902
AFOSR-66-1514
Availability: Published in Transactions of the American Mathematical Society v116 n4 p227-37 Apr 1965.

Descriptors: (*Functions, *Sequences), Polynomials, Approximation (Mathematics).

Unless the poles of a rational function of best approximation are prescribed in advance, the determination of those poles even approximately may be difficult, yet be necessary for a complete study of approximation or convergence. The object of the note is to enlarge the category of those cases where this determination is possible, especially to study approximation on a set having no interior points, and on a set with several components. The methods are based on the use of geometric degree of convergence, in various forms, including methods developed in the theory of approximating polynomials. (Author)

AD-638 930 **Field 12A**
Not available from CFSTI.
Chicago Univ., Ill. Dept. of Mathematics.
A THEOREM ON LEFT NOETHERIAN RINGS.
by I. N. Herstein. 1966, 7p
AROD-4197:2
Availability: Published in Journal of Mathematical Analysis and Applications v15 n1 p91-6 Jul 1966.

Descriptors: (*Theorems, *Rings (Mathematics)), Polynomials, Identities, Algebra.

Identifiers: Noetherian rings, Levitzki's theorem.

AD-638 997 **Field 12A**
Not available from CFSTI.
Stanford Univ., Calif.
PREDICATIVE PROVABILITY IN SET THEORY.
by S. Feferman. 27 Jan 66, 5p
Grant DA-ARO (D)-31-124-G655
AROD-2379:20
Availability: Published in Bulletin of the American Mathematical Society v72 n3 p486-9 May 1966.

Descriptors: (*Set theory, *Mathematical logic), Series.

AD-638 998 Field 12A
Not available from CFSTI.
Stanford Univ., Calif.
PERSISTENT AND INVARIANT FORMULAS RELATIVE TO THEORIES OF HIGHER ORDER.
by S. Feferman, and G. Kreisel. 27 Jan 66. 8p
Grant DA-ARO (D)-31-124-G655
AROD-2379:21
Availability: Published in Bulletin of the American Mathematical Society v72 n3 p480-5 May 1966.

Descriptors: (*Model theory, *Mathematical logic), Invariance, Set theory.

AD-639 011 Field 12A
Not available from CFI.
California Univ., Los Angeles.
EXISTENCE OF POSITIVE HARMONIC FUNCTIONS.
Revised ed.
by Mitsuru Nakai. 13 Dec 65. 4p
Grant DA-ARO (D)-31-124-G499
AROD-1517:80
Revision of manuscript submitted Nov 10 1965.
Prepared in cooperation with Nagoya Univ. (Japan).
Availability: Published in The Proceedings of the American Mathematical Society v17 n2 p365-7 Apr 1966.

Descriptors: (*Potential theory, *Complex variables), Boundary value problems, Functions.

AD-639 014 Field 12A
Not available from CFSTI.
California Univ., Los Angeles.
FINITE INTERPOLATION FOR ANALYTIC FUNCTIONS WITH FINITE DIRICHLET INTEGRALS.
by Mitsuru Nakai. 18 Aug 65. 5p
Grant DA-ARO (D)-31-124-G499
AROD-1517:77
Prepared in cooperation with Nagoya Univ. (Japan).
Availability: Published in Proceedings of the American Mathematical Society v17 n2 p362-4 Apr 1966.

Descriptors: (*Functions, Approximation (Mathematics)), Complex variables, Integrals.

AD-639 016 Field 12A
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md. Dept. of Statistics.
A REAPPRAISAL OF THE PERIODOGRAM IN SPECTRAL ANALYSIS.
Revised ed.
by Richard H. Jones. May 65. 15p
Contract AF 49 (638)-1302
Proj. AF-9749
Task 974902
AFOSR-66-0264
Revision of manuscript submitted Mar 64.
Availability: Published in Technometrics v7 n4 p531-41 Nov 1965.

Descriptors: (*Statistical analysis, *Series), Fourier analysis, Integral transforms, Time.

Identifiers: Periodograms, Spectral analysis.

The purpose of the paper is to revive interest in the periodogram approach to time series analysis which, at present, is only of historical interest and is seldom used. During the late 1940's, when it was realized that the smoothed periodogram could be used to estimate the spectral density of a stationary time series, the method was impractical because of the amount of computations. This is no longer the case, but not realized by many applied workers. In this paper the smoothed periodogram is considered from the point of view of its spectral window. The results are compared with two standard spectral windows by a method which avoids defining a bandwidth. The spectral windows are normalized so that they have the same variance, and plotted. The user can then choose the window which best suits his needs. Rejection filtering, trigonometric regression and cross-spectral analysis are discussed. An example is given in which the spectra and cross-spectrum of a bivariate time series are estimated. (Author)

AD-639 018 Field 12A
Not available from CFSTI.
RIAS Inc., Baltimore, Md.
THE CONDITION OF REGULAR DEGENERATION FOR SINGULARLY PERTURBED SYSTEMS OF LINEAR DIFFERENTIAL-DIFFERENCE EQUATIONS.
by Kenneth L. Cooke, and Kenneth R. Meyer. 1963. 26p
Contracts AF 49 (638)-1242, NASw-845
Proj. AF-9749
Task 974901
AFOSR-66-1196
Prepared in cooperation with Pomona Coll., Claremont, Calif., and RIAS, Baltimore, Md.
Availability: Published in Journal of Mathematical Analysis and Applications v14 n1 p83-106 Apr 66.

Descriptors: (*Differential equations, *Difference equations), Perturbation theory, Sequences.

A system of linear, constant coefficient differential-difference equations with several retardations is considered under singular perturbation. The existence of the solution to the degenerate equation is discussed and explicit formulas found for the solution. A working definition of complete regularity and the main convergency theorems are developed. The concept of complete regularity is discussed and an equivalent (usable) formulation is given to this concept. (Author)

AD-639 019 Field 12A
Not available from CFSTI.
Brown Univ., Providence, R. I. Div. of Applied Mathematics.
ON THE STOCHASTIC MAXIMUM PRINCIPLE WITH 'AVERAGE' CONSTRAINTS.
by Harold J. Kushner. 1965. 16p
Contracts AF 49 (638)-1206, NASw-845
Proj. AF-9749
Task 974901
AFOSR-66-0559
Prepared in cooperation with Center for Control Theory, Baltimore, Md.
Availability: Published in Journal of Mathematical Analysis and Applications v12 n1 p13-26 Aug 65.

Descriptors: (*Stochastic processes, *Calculus of variations), Optimization, Geometry, Control, Measure theory.

AD-639 052 Field 12A, 9B
CFSTI Prices: HC$1.00 MF$0.50
Stanford Univ., Calif. Dept. of Computer Science.
HOW DO YOU SOLVE A QUADRATIC EQUATION. *
Technical rept.
by George E. Forsythe. 16 Jun 66. 22p CS-40
Contract Nonr-225 (37)
Proj. NR-044-211

Descriptors: (*Algorithms, Equations), (*Programming (Computers), Polynomials), Algebra, Real numbers.

Identifiers: Quadratic equation, Floating-point operation.

The nature of the floating-point number system of digital computers is explained to a reader whose university mathematical background is very limited. The possibly large errors in using mathematical algorithms blindly with floating-point computation are illustrated by the formula for solving a quadratic equation. An accurate way of solving a quadratic is outlined. A few general remarks are made about computational mathematics, including the backwards analysis of rounding error. (Author)

AD-639 163 Field 12A, 15E
CFSTI Prices: HC$3.00 MF$0.75
RAND Corp., Santa Monica, Calif.
POWER OF THE F-TEST FOR NONNORMAL DISTRIBUTIONS AND UNEQUAL ERROR VARIANCES.
by T. S. Donaldson. Sep 66. 65p RM-5072-PR
Contract AF 49 (638)-1700

Descriptors: (*Statistical tests, *Analysis of variance), (*Logistics, Maintenance), Programming (Computers), Statistical distributions, Errors.

An empirical investigation was made of the power of the F-test when the underlying distribution is nonnormal and the within-cell variances are not homogeneous. It is shown that even for small samples the analysis-of-variance F-test is valid, although the usual assumptions of normal distribution and homogeneous error variances are seriously violated. The test is shown to be valid for both Type I and Type II error. An analysis of the correlation between the numerator and denominator of the null hypothesis F-ratio demonstrates that the distribution of F is little affected by the shape of the underlying distribution. (Author)

AD-639 175 Field 12A
Not available from CFSTI.
Hebrew Univ., Jerusalem (Israel).
ON KERNELS, EIGENVALUES, AND EIGENFUNCTIONS OF OPERATORS kELATED TO ELLIPTIC PROBLEMS.
by Shmuel Agmon. Jan 65. 40p
Grant AF-EOAR-18-66
Proj. AF-9749
Task 974902
AFOSR-66-1211
Availability: Published in Communications on Pure and Applied Mathematics v18 n4 p627-63 Nov 1965.

Descriptors: (*Operators (Mathematics), Green's function), Matrix algebra, Integrals, Partial differential equations, Israel.

In this paper an indirect method of estimating Green's kernels is described. It yields pointwise estimates which hold uniformly in all space variables. Moreover this method uses very little of the properties of elliptic differential operators and applies to a general class of integral operators which need not be connected with differential problems. Further, the formula of the asymptotic distribution of positive (and of negative) eigenvalues for very general selfadjoint elliptic problems whose spectrum may extend to infinity on both sides of the real line is established using the derived estimates. The corresponding asymptotic results for the eigenfunctions (spectral function) are also established. (Author)

AD-639 193 Field 12A
Not available from CFSTI.
Minnesota Univ., Minneapolis. Dept. of Mathematics.
GENERALIZED INVERSES AND GENERALIZED GREEN'S FUNCTIONS.
Revised ed.
by W. S. Loud. 1 Jul 65. 30p
Grant DA-ARO (D)-31-124-G231
AROD-1465:9
Revision of manuscript submitted 25 Nov 64.
Availability: Published in J. SIAM Appl. Math. v14 n2 p342-69 Mar 1966.

Descriptors: (*Matrix algebra, *Green's function), Operators (Mathematics), Integrals.

Identifiers: Generalized matrix inverse.

AD-639 227 Field 12A
Not available from CFSTI.
Frank J. Seiler Research Lab., Air Force Academy, Colo.
UNCOUNTABLY MANY DIFFERENT INVOLUTIONS OF S (3).
by W. R. Alford. 14 Aug 64, 16p SRL-66-0003
Proj. AF-7904
Task 790400
Availability: Published in The Proceedings of the American Mathematical Society v17 n1 p186-96 Feb 1966.

Descriptors: (*Topology, Spheres), Groups (Mathematics), Set theory.

In 1952 R.H. Bing constructed an involution, a homeomorphism of period two, of the three sphere that is not equivalent to any differentiable homeomorphism. Two homeomorphisms are equivalent if they are conjugate in the group of homeomorphisms. In Bing's example, the involution is a 'reflection' of S (3) through a wild two sphere. Dean Montgomery and Leo Zippin modified Bing's example to get an involution of S (3) that is a 'rotation' about a wild simple closed curve. The author constructs a family of inequivalent involutions, 'rotations' about wild one spheres, with cardinality of the continuum. The proof depends on the not easily proved statement that their fixed point sets are inequivalently embedded. (Author)

AD-639 250 Field 12A
Not available from CFSTI.
Texas Univ., Austin.
SOME MATRIX INEQUALITIES.
by Ky Fan. 1966, 16p
Grant DA-ARO (D)-31-124-G388
AROD-3772:14
Prepared in cooperation with Northwestern Univ., Evanston, Ill, Grant NSF-GP-3893.
Availability: Published in Hbg. Math. Abh. v29 n3/4 p185-96 Jun 1966.

Descriptors: (*Inequalities, *Matrix algebra), Theory.

AD-639 251 Field 12A
Not available from CFSTI.
Texas Univ., Austin.
APPLICATIONS OF A THEOREM CONCERNING SETS WITH CONVEX SECTIONS.
by Ky Fan. 6 Jul 65, 15p
Grant DA-ARO (D)-31-124-G388
AROD-3772:15
Prepared in cooperation with Northwestern Univ., Evanston, Ill., Grant NSF-GP-3893.
Availability: Published in Math. Annalen v163 p189-203 1966.

Descriptors: (*Set theory, *Convex sets), Topology, Real numbers, Matrix algebra, Theorems.

AD-639 266 Field 12A
Not available from CFSTI.
Stanford Univ., Calif.
THE TRICOMI PROBLEM FOR AN EQUATION OF ABRUPTLY CHANGING TYPE.
by Lesley M. Sibner. Feb 65, 14p
Grant NSF-GP-2426
AROD-247:69
Prepared in cooperation with Courant Inst. of Mathematical Sciences, New York Univ., N. Y., Grant DA-ARO (D)-31-124-G156.
Availability: Published in Communications on Pure and Applied Mathematics v19 n1 p35-47 Feb 1966.

Descriptors: (*Boundary value problems, *Differential equations), Potential theory, Functional analysis, Operators (Mathematics), Partial differential equations.

AD-639 300 Field 12A, 9D
CFSTI Prices: HC$4.00 MF$0.75
Cruft Lab., Harvard Univ., Cambridge, Mass.
NUMERICAL OPERATIONS ON RANDOM FUNCTIONS.
Technical rept.
by Willis C. Kellogg. Apr 66, 106p TR-496
Contract Nonr-1866 (16)
Proj. NR-372-012

Descriptors: (*Statistical functions, *Numerical methods and procedures), Analog-to-digital converters, Pulse code modulation, Sampling.

The work investigates the problem of obtaining a sampled-data representation of a random function, and operating on this representation to obtain approximate reconstruction of the random function or the result of performing a linear operation on it. The author considers cases in which the input is available to the presampling filter only for a finite time, and only a finite number of samples are available for reconstruction. He describes a set of computer programs in which the optimum filters are designed, and the associated mean squared errors evaluated, by time-domain techniques. These programs compute the effects of both sampling errors and quantization errors. He includes quantitative comparisons of PCM system performance with Shannon's rate-distortion function. (Author)

AD-639 307 Field 12A
CFSTI Prices: HC$3.00 MF$0.50
California Univ., Los Angeles. Numerical Analysis Research.
ENUMERATION OF LATIN SQUARES AND ISOMORPHISM DETECTION IN FINITE PLANES.
Technical rept.
by John Wesley Brown. 1966, 63p Rept. no. 66-3
Contract Nonr-233 (76)
Proj. NR-044-144
Doctoral thesis.

Descriptors: (*Combinatorial analysis, *Permutations), (*Projective geometry, Combinatorial analysis), Algorithms.

Identifiers: Theses.

In Chapter I, various necessary conditions for isomorphism between latin rectangles are developed by treating the rectangles as sets of permutations, and studying the cycle structure of the permutations. An enumeration procedure for latin squares, which operates by forming successively higher order rectangle representatives, is then given, and the theory is applied to latin squares of order 8, yielding 1,676,257 representative squares. Chapter II details a reversible process for obtaining a complete set of orthogonal squares from a finite projective plane of the same order, and an algorithm for determining when two projective planes, in orthogonal squares form, are isomorphic is then given. The algorithm operates by constructing a minimal set of orthogonal sets for each known plane, and testing some one orthogonal set from a prospective new plane against them. Chapter III discusses known methods of generating projective planes of order n from latin squares of order n - 1. (Author)

AD-639 398 Field 12A
CFSTI Prices: HC$1.00 MF$0.50
Kansas Univ., Lawrence. Dept. of Mathematics.
ON NON-LINEAR ORDINARY AND EVOLUTION EQUATIONS.
Technical rept.
by Haruo Murakami. Jun 66, 19p TR-9
Contract Nonr-583 (13), Grant NSF-G-17057
Prepared in cooperation with Kobe Univ. (Japan).

Descriptors: (*Nonlinear differential equations, *Functional analysis), Theorems, Partial differential equations.

AD-639 427 Field 12A, 20K
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
ON THE USE OF THE AVERAGING METHOD TO SOLVE ONE EQUATION IN PARTIAL DERIVATIVES, ENCOUNTERED IN THE THEORY OF OSCILLATIONS.
by O. A. Zhautykov. 17 Jun 66, 14p FTD-TT-65-1917
TT-66-62332
Unedited rough draft trans. of Priblizhennye Metody Resheniya Differentsialnykh Uravnenii (USSR) n2 p52-61 1964.

Descriptors: (*Partial differential equations, Approximation (Mathematics)), (*Oscillation, Theory), Fourier analysis, Series, USSR.

AD-639 464 Field 12A
CFSTI Prices: HC$1.00 MF$0.50
Northwestern Univ., Evanston, Ill.
ON NEWTON'S METHOD FOR THE SOLUTION OF SYSTEMS OF EQUATIONS.
by Adi Ben-Israel. Aug 65, 18p
Contracts Nonr-1228 (10), DA-31-124-ARO (D)-322
Prepared in cooperation with Technion-Israel Inst. of Tech., Haifa.

Descriptors: (*Iterative methods, *Matrix algebra), Functional analysis, Differential equations, Least squares method, Israel.

Newton's method for solving systems of equations is extended to rectangular systems and singular Jacobians by using generalized inverses. (Author)

AD-639 466 Field 12A
CFSTI Prices: HC$3.00 MF$0.75
Stanford Univ., Calif. Dept. of Statistics.
A CLASS OF NON-PARAMETRIC ESTIMATES OF A SMOOTH REGRESSION FUNCTION.
Technical rept.
by Richard M. Royall. 11 Aug 66, 74p TR-91
Contract Nonr-225 (53)
Proj. NR-042-002
Research supported in part by PHS, grant PHS-5T1-GM-25-09.

Descriptors: (*Statistical analysis, *Statistical functions), Stochastic processes, Correlation techniques.

Identifiers: Regression analysis.

The purpose of the paper is to develop methods for estimating regression functions (i.e., conditional expectations) when nothing is known or assumed about their underlying functional form. The approach is 'non-parametric' in the sense that the regression function itself, rather than a set of numerical parameters, is estimated. The methods given make use of certain rank order statistics and thereby avoid problems of scaling which are troublesome when less sophisticated non-parametric methods are used. The large sample performance of the proposed regression estimators is studied in detail and methods for obtaining high orders of asymptotic efficiency are given. The asymptotic (normal) distribution of the estimates is obtained and the related problem of prediction is discussed. (Author)

AD-639 471 Field 12A
Not available from CFSTI.
Kansas Univ., Lawrence.
ON THE GENERAL INTEGRAL TRANSFORMATIONS.
by N. Aronszajn, and P. Szeptycki. 28 Jul 65, 28p
Contract Nonr-583 (13), Grant NSF-G-17057
Availability: Published in Math. Annalen v163 p127-54 1966.

Descriptors: (*Integral transforms, Theory), Functional analysis, Measure theory, Topology.

AD-639 478 Field 12A
Not available from CFSTI.
Harvard Univ., Cambridge, Mass. Dept. of Statistics.

ALTERNATIVE EFFICIENCIES FOR SIGNED RANK TESTS.
Technical rept.
by Jerome Klotz. 29 Mar 65, 11p TR-7
Contract Nonr-1866 (37), Grant NSF-GP-683
Proj. NR-042-097
Prepared in cooperation with San Diego State Coll., Calif., Grant NSF-G-12973.
Availability: Published in The Annals of Mathematical Statistics v36 n6 p1759-66 Dec 1965.

Descriptors: (*Statistical tests, Effectiveness), Stochastic processes.

Asympotic efficiency curves for the one sample Wilcoxon and normal scores tests are obtained by comparing the exponential rate of convergence to zero of the type I error (alpha) while keeping the type II error (beta) fixed ($0 < \text{beta} < 1$). A wider than usual view of test performance consistent with small sample results is obtained. The pitman efficiency value is derived as a special case when the alternative approaches the null hypothesis. Comparisons of the signed rank test relative to the mean or t for normal location alternatives yield small efficiency values for extreme alternatives. The relative performance of the Wilcoxon is seen to be slightly better than the normal scores for normal alternatives with larger location parameter values despite the local (Pitman) optimality of the normal scores. Similar results hold for two other non-normal alternatives considered. (Author)

AD-639 487 **Field 12A, 20C, 20N**
CFSTI Prices: HC$3.00 MF$0.75
Foreign Technology Div., Wright-Patterson AFB, Ohio.
NUMERICAL METHODS OF SOLVING DIFFERENTIAL AND INTEGRAL EQUATIONS AND QUADRATURE FORMULAS: SELECTED ARTICLES.
31 May 66, 59p FTD-TT-65-1655
TT-66-62349
Chislennye Metody Resheniya Differentsialnykh i Integralnykh Uravneni i Kvadraturnye Formuly, edited trans. of mono Vychislitelnya Matematika i Matematicheskya Fizika Moscow 1964 p255-74, 304-25.

Descriptors: (*Numerical methods and procedures, *Differential equations), (*Integral equations, Numerical methods and procedures), Diffraction, Field theory, Electromagnetic waves, Disks, Dipole moments, Two-dimensional flow, Boundary layer, USSR.

Contents: Diffraction of the Field of a Horizontal Magnetic Dipole on Two Discs, by Ye. A. Ivanov; Diffraction of Electromagnetic Waves on Two Parallel Discs, by Ye. A. Ivanov; and Numerical Calculation of Two-Dimensional Flow in a Boundary Layer, by I. V. Petukhov.

AD-639 502 **Field 12A**
Not available from CFSTI.
Technische Hochschule, Munich (West Germany). Mathematisches Institut.
A STUDY OF STRONG AND WEAK STABILITY IN DISCRETIZATION ALGORITHMS.
by Hans J. Stetter. 1 Feb 65, 17p
Grant AF-EOAR-77-63
Proj. AF-9749
Task 974901
AFOSR-66-0389
Availability: Published in Journal SIAM Numerical Analysis v2 (serB) n2 p265-80 1965.

Descriptors: (*Algorithms, Stability), (*Numerical methods and procedures, *Differential equations), Perturbation theory, Boundary value problems, West Germany.

AD-639 503 **Field 12A**
Not available from CFSTI.
Technische Hochschule, Munich (West Germany). Mathematisches Institut.
NUMERICAL TREATMENT OF ORDINARY DIFFERENTIAL EQUATIONS BY EXTRAPOLATION METHODS.
by Roland Bulirsch, and Josef Stoer. 3 Jun 65, 16p
Grant AF-EOAR-77-63
Proj. AF-9749
Task 974901
AFOSR-66-1419
Availability: Published in Numerische Mathematik v8 p1-13 1966.

Descriptors: (*Differential equations, *Numerical methods and procedures), Programming (Computers), Algorithms, West Germany.

The paper examines practical aspects of extrapolation methods for solving the initial value problem for systems of ordinary differential equations. An algorithm is developed which uses rational function for extrapolation, and is based on a slightly modified form of the midpoint rule for the underlying discretization method. The proposed method is compared with such alternatives as Runge-Kutta and extrapolations with polynomials. The comparison shows clearly that rational extrapolation yields more accurate results, needs less operations and is easier to program. (Author)

AD-639 534 **Field 12A**
Not available from CFSTI.
Kent Univ., Canterbury (England).
APPROXIMATION BY SEQUENCES OF PADE APPROXIMANTS IN REGIONS OF MEROMORPHY.
by J. S. R. Chisholm. 1964, 8p
Grant AF-EOAR-61-64
Proj. AF-9767
Task 976701
AFOSR-66-1586
Prepared in cooperation with Texas A and M Univ., College Station. Dept. of Physics.
Availability: Published in Journal of Mathematical Physics v7 n1 p39-44 Jan 1966.

Descriptors: (*Sequences, *Approximation (Mathematics)), Continued fractions, Series, Functions, Great Britain.

Identifiers: Pade approximation.

It is shown that sequences (P sub mn (z)) of Pade approximants with m and n approaching infinity approximate a function f (z) inside a certain circle of meromorphy with centre at $z = 0$. Extensions of this result are discussed. (Author)

AD-639 576 **Field 12A, 9A**
CFSTI Prices: HC$2.00 MF$0.50
Case Inst. of Tech., Cleveland, Ohio.
SOME VARIATIONS ON THE USE OF BUTTERWORTH POLYNOMIALS.
by William E. Blum. Jun 66, 33p Scientific-12
Contract AF 19 (628)-1699
Proj. AF-5635
Task 563501
AFCRL-66-324

Descriptors: (*Polynomials, Approximation (Mathematics)), (*Electrical networks, Synthesis), Functions.

After reviewing the conventional use of Butterworth polynomials, a new technique is proposed which employs the sum and difference of such polynomials. These sums and differences are used to form rational functions which approximate certain transfer characteristics. All these new approximations are shown to be realizable as the transfer function of a three-terminal RLC network. From this work emerges the interesting fact that the weighted sum of two consecutive Butterworth polynomials is Hurwitz, i.e., B sub n (s) + alpha B sub n-1 (s) is Hurwitz for all alpha 0. (Author)

AD-639 595 **Field 12A**
CFSTI Prices: HC$1.60 MF$0.50
Ballistic Research Labs., Aberdeen Proving Ground, Md.
ON BERNOULLI'S METHOD FOR SOLVING ALGEBRAIC EQUATIONS.
by Bernard Dimsdale. 23 Sep 47, 9p Rept. no. 646

Descriptors: (*Algorithms, *Equations), Algebra, Programming (Computers).

Identifiers: Bernoulli's method.

There are two methods for solving algebraic equations which appear to be useful in computation by automatic computing machinery. Graeffe's method gives easily only absolute values of the roots. Bernoulli's method as originally stated gives the root itself, except for certain cases where the method fails. This report extends the method to include such cases also. (Author)

N66-24232 **Field 12A**
CFSTI Prices HC$2.00 MF$0.50
Laboratoire De Physique Theorique Et Des Hautes Energies, Orsay (France).
ANALYTIC PROPERTIES OF A CLASS OF POTENTIALS AND THE CORRESPONDING JOST FUNCTIONS.
by P. C. Sabatier. Mar 66, 42p TH/140

Descriptors: Amplitude, Analysis, *Analytic function, Function, Inverse, Jost function, Mechanics, *Phase shift, Physics, Potential, Regge pole, *Scattering, Schroedinger equation, Theoretical, *Theoretical physics, Wave.

For abstract, see S 04 13.

N66-24243 **Field 12A**
CFSTI Prices HC$3.00 MF$0.50
Deutsche Versuchsanstalt Fur Luft- Und Raumfahrt, Oberpfaffenhofen (West Germany).
A REPRESENTATION OF TRAJECTORY AND VELOCITY CO-ORDINATES FOR SPACE FLIGHT BY A GENERALIZED KEPLER-APPROXIMATION AND CORRECTIONS IN THE ITERATION PROCEDURE.
Eine Darstellung Fur Bahn- Und Geschwindigkeitskoordinaten In Der Raumfahrt Durch Eine Verallgemeinerte Kepler-naherung Und Korrekturen In Iterationsverfahren
by W. Bollermann. Mar 66, 59p DLR-FB-66-08
In German, English Summary

Descriptors: Initial, *Initial value problem, *Interplanetary trajectory, *Kepler law, Motion, Perturbation, *Perturbation theory, Problem, Space flight, Spacecraft, *Spacecraft trajectory, Theory, Thrust, Trajectory, Value.

For abstract, see S 04 13.

N66-24395 **Field 12A**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CONCERNING THE PROPER ROTATIONS OF A 3- DIMENSIONAL ORTHOGONAL FRAME.
by A. G. Gluckman. Jan 66, 15p NASA-TM-X-55449, X-547-66-16

Descriptors: Analysis, Axis, Coordinate, Dimensional, Element, *Frame, Group, Matrix, *Matrix analysis, Multiplex, Orthogonal, *Orthogonal multiplexing theory, Proper, *Rotation, Subgroup, Theory, Three, *Unitarity.

For abstract, see S 04 13.

N66-24590 **Field 12A**
CFSTI Prices HC$3.00 MF$0.50
Brown Univ., Providence, R. I.
PERIODIC SOLUTIONS OF DIFFERENTIAL EQUATIONS WITH TIME LAG CONTAINING A SMALL PARAMETER.

by C. Perello. 1965, 54p NASA-CR-74614
Contracts NAS8-11264, AF-AFOSR-693-65

Descriptors: Delay, Differential, *Differential equation, Equation, Function, Lag, Parameter, Periodic, *Periodic function, Problem, *Problem solving, Small, Solution, Time, *Time delay.

For abstract, see S 04 13.

N66-24935 **Field 12A**
CFSTI Prices HC$3.00 MF$0.75
California Univ., Berkeley.
NONLINEAR PROGRAMMING AND OPTIMAL CONTROL.
by P. P. Varaiya. May 66, 62p NASA-CR-479
Grant NSG-354

Descriptors: Control, Decomposition, *Mathematical model, Mathematics, Maximum, Method, Model, Nonlinear, *Nonlinear programming, Optimal, *Optimization, Pontryagin principle, Programming, Theory.

For abstract, see S 04 13.

N66-24937 **Field 12A**
CFSTI Prices HC$4.00 MF$0.75
Northrop Space Labs., Huntsville, Ala.
SIMULTANEOUS SOLUTION OF NON-LINEAR ALGEBRAIC EQUATIONS TECHNICAL MEMORANDUM NO. 163.
by L. M. Bhalla, V. C. Lillard, and F. B. Tatom.
9 Mar 66, 111p NASA-CR-74771, E-Z0-177
Contract NAS8-20183

Descriptors: Algebra, Analysis, *Circuit, Computer, *Computer program, Digital, Equation, *Filter, Newton-raphson method, Nonlinear, *Nonlinear equation, Program.

For abstract, see S 04 13.

N66-25020 **Field 12A**
CFSTI Prices HC$2.00 MF$0.50
Kent State Univ., Ohio.
ON CERTAIN INFORMATION-THEORETIC CONCEPTS IN THE THEORY OF GRAPHS.
by M. C. Wilson. May 66, 47p NASA-CR-478
Grant NSG-568

Descriptors: Chain, Communications, Determination, Distribution, Dynamics, *Entropy, Function, *Graph, Group, Information, *Information theory, *Markov chain, Probability, *Probability distribution, Process, Random, *Random process, Stochastic, Theory, Uncertainty.

For abstract, see S 04 13.

N66-25310 **Field 12A**
CFSTI Prices HC$1.00 MF$0.50
Pennsylvania State Univ., University Park.
ON THE MICHAILOV CRITERION FOR EXPONENTIAL POLYNOMIALS.
by A. M. Krall. May 66, 20p NASA-CR-489
Contract NGR-39-009-041

Descriptors: Circle, Criterion, Exponent, *Exponential function, Function, Half, Imaginary, Number, Origin, Plane, *Polynomial, Proving, Right, Theorem, *Theorem proving, Zero.

For abstract, see S 04 13.

N66-25374 **Field 12A**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
THE VARIANCE OF SPECTRAL ESTIMATES.
by E. R. Rodemich. 31 Mar 66, 28p NASA-CR-74958, JPL-TR-32-892
Contract NAS7-100

Descriptors: Accuracy, Computation, Density, Distribution, Energy, Flat, Function, Spectral, *Spectral energy distribution, Spectrum, Step, *Step function, *Variance.

For abstract, see S 04 13.

N66-25641 **Field 12A**
CFSTI Prices HC$4.00 MF$0.75
France. Ministere De L Air, Paris.
COLLOQUIUM ON NUMERIC CALCULATION AND APPLIED MATHEMATICS.
Colloque De Calcul Numerique Et Mathematiques Appliquees
1966, 110p NT-148
1966 110 P Refs In French Colloq. Held At Meeting Of The Congr. De L'assoc. Francaise Pour L8advan. Des Sci., Rennes, France, 1963

Descriptors: Algebra, Constant, Dependency, Differential, *Differential geometry, Function, Geometry, Kinetics, *Mathematics, Matrix, *Matrix algebra, Physical, Physics, Relation, Statistics, Thermal, Time, *Time dependency, Transcendental, *Transcendental function.

For abstract, see S 04 14.

N66-26167 **Field 12A**
CFSTI Prices HC$5.00 MF$1.00
Chalmers Univ. Of Technology, Goteborg (Sweden).
FUNCTIONS SIMPLIFYING THE USE OF LEVY'S PLATE SOLUTION.
by B. A. Akesson. 1965, 162p
Its Trans. No. 301

Descriptors: Algebra, Analysis, Calculation, Fourier series, Function, Loading, *Loading moment, *Mathematics, Moment, Numerical, *Numerical analysis, Physics, Plate, *Plate theory, Real, Rectangle, S function, Theory, Variance.

For abstract, see S 04 14.

N66-26652 **Field 12A**
CFSTI Prices HC$3.00 MF$0.50
Midwest Research Inst., Kansas City, Mo.
ANALYSIS OF THE COUPLED FREQUENCIES AND MODE SHAPES OF VEHICLE CONTROL SYSTEMS FINAL REPORT, 15 APR. 1965 - 14 APR. 1966.
by Y. L. Luke, and R. Moran. 19 Apr 66, 52p
NASA-CR-75114
Contract NAS8-20139

Descriptors: Analysis, Computer, Control, *Control system, Couple, Eigenvalue, Fortran, Frequency, *Ibm 1620 computer, Matrix, Missile, Mode, *Mode shape, Numerical, *Numerical analysis, Polynomial, Shape, Vector, Vehicle.

For abstract, see S 04 14.

N66-34675 **Field 12A**
CFSTI Prices HC$3.00 MF$0.75
Case Inst. Of Tech., Cleveland, Ohio.
AN EQUITRIANGULAR INTEGRAL TRANSFORM AND ITS APPLICATIONS.
by P.-C. Lu, and R. W. Miller. Jun 66, 90p
NASA-CR-77339, FTAS/TR-66-6
Contract NGR-36-003-064

Descriptors: Boundary, *Boundary value problem, Conduction, Convection, Equal, Finite, Flow, Fluid, *Heat transfer, Incompressible, Integral, Laplace operator, Problem, Transform, *Transform integral, Triangle, Value, Viscous, *Viscous flow.

For abstract, see S 04 20.

N66-34693 **Field 12A**
CFSTI Prices HC$1.00 MF$0.50
Alabama Univ., University.
TOPOLOGICAL DYNAMICS INTERIM REPORT.
1966, 3p NASA-CR-77382
Contract NAS8-1646

Descriptors: Application, *Dynamics, *Mathematics, Space, Theorem, *Topology, Transformation.

For abstract, see S 04 20.

N66-35109 **Field 12A**
CFSTI Prices HC$1.00 MF$0.50
Copenhagen Univ. (Denmark).
ATTRIBUTE SAMPLING PLANS BASED ON PRIOR DISTRIBUTIONS AND COSTS.
by A. Hald. May 66, 14p AD-635451
Contract N62558-3073

Descriptors: Asymptote, *Bayesian statistics, Decision, *Decision theory, Mathematics, *Sampling, Series, Single, Statistics, Theory.

For abstract, see S 04 20.

N66-35188 **Field 12A, 20D**
CFSTI Prices HC$1.00 MF$0.50
Centro Brasileiro De Pesquisas Fisicas, Rio De Janeiro.
ON THE STABILITY OF THE PLANE-WAVE HARTREE- FOCK STATE.
by A. M. De graaf, and R. Luzzi. 1965, 14p
Its Notas De Fisica Vol. 12, No. 3

Descriptors: Calculation, Damping, Density, Fermion, Hamiltonian, *Hartree-fock calculation, Interaction, *Landau damping, Physics, Plane, *Plane wave, Spin, Static, Theoretical, Wave.

For abstract, see S 04 20.

N66-35191 **Field 12A**
CFSTI Prices HC$1.00 MF$0.50
Centro Brasileiro De Pesquisas Fisicas, Rio De Janeiro.
NOTE ON THE ROLE PLAYED BY CANONICAL QUANTITIES IN FLUCTUATION THEORY.
by R. C. Da costa. 1965, 17p
Its Notas De Fisica Vol. 11, No. 21

Descriptors: Canonical, *Canonical problem, Fluctuation, *Fluctuation theory (stat mech), Geometry, Mechanics, Motion, Physical, Physics, Problem, Property, Statistical, Theoretical, Theory.

For abstract, see S 04 20.

N66-35303 **Field 12A**
CFSTI Prices HC$3.75 MF$1.50
United Kingdom Atomic Energy Authority, Harwell (England).
ELEMENTARY MATHEMATICAL LOGIC AND SOME APPLICATIONS TO ELECTRONICS.
by P. A. Newson. May 66, 230p AERE-R-4937

Descriptors: Arithmetic, Binary, Circuit, Coding, Computer, Design, Electronics, Logic, *Logical design, *Mathematics, Memory, *Relay, Scaling, Storage, Transistor, *Transistor logic.

For abstract, see S 04 20.

PB-170 809 **Field 12A, 13H**
CFSTI Prices: HC$1.00 MF$0.50
Wisconsin Univ., Madison. Dept. of Statistics.
MODELS FOR PREDICTION AND CONTROL. I. AIMS AND MEANS.
by G. E. P. Box, and G. M. Jenkins. May 66, 15p
Technical rept. TR-72
Grant NSF-GP-2755
Prepared in cooperation with Lancaster Univ. (England), Dept. of Systems Engineering.

Descriptors: (*Mathematical models, Management engineering), Scheduling, Industrial production, Inventory control, Stochastic processes.

PB-170 817 Field 12A
CFSTI Prices: HC$2.00 MF$0.50
Wisconsin Univ., Madison. Dept. of Statistics.
A JOINT DESIGN CRITERION FOR THE DUAL PROBLEM OF MODEL DISCRIMINATION AND PARAMETER ESTIMATION.
by William J. Hill, and William G. Hunter. May 66, 30p Technical rept. TR-69
Grant NSF-GP-2755

Descriptors: (*Mathematical models, Experimental design), Statistical analysis.

AD-638 725 **See Field 18D**

AD-638 851 **See Field 5A**

AD-638 859 **See Field 20D**

AD-638 889 **See Field 7D**

AD-638 905 **See Field 4A**

AD-639 221 **See Field 20K**

AD-639 316 **See Field 20J**

AD-639 334 **See Field 20C**

AD-639 448 **See Field 20K**

AD-639 483 **See Field 20K**

AD-639 572 **See Field 20H**

AD-639 578 **See Field 22C**

12B. OPERATIONS RESEARCH

AD-638 736 Field 12B
CFSTI Prices: HC$1.10 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
BAYESIAN ESTIMATION OF REPLACEMENT DEMAND.
by Ronald A. Howard. 31 Jul 63, 9p Working Memo-144

Descriptors: (*Statistical analysis, *Replacement theory), (*Stock level control, Replacement theory), Distribution functions.

AD-638 737 Field 12B
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
SUMMARY OF RESULTS OBTAINED FROM REPLACEMENT PROGRAM, MARK I.
by Joan T. Sullivan. 26 Apr 63, 20p Working Memo-127

Descriptors: (*Replacement theory, *Inventory analysis), Life expectancy, Statistical analysis, Stock level control.

AD-638 738 Field 12B
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
DISTRIBUTION OF A POWER OF A LOGNORMALLY DISTRIBUTED VARIATE.
by Harlan C. Meal. 30 Apr 63, 6p Working Memo-126

Descriptors: (*Inventory analysis, *Statistical analysis), Inventory control, Distribution functions, Stock level control.

The memorandum describes a technique for determining the fraction of inventory allocated to items with sales rates in a specified range when the inventory has been allocated to each item in proportion to a power of the item sales rate. It is assumed that item sales rates are lognormally distributed. (Author)

AD-638 739 Field 12B
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
ESTIMATES OF STANDARD RATIO.
by Robert G. Brown. 10 Apr 63, 4p Working Memo-122

Descriptors: (*Inventory analysis, *Statistical analysis), Distribution functions, Inventory control.

AD-638 740 Field 12B
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
THE NEGATIVE BINOMIAL DISTRIBUTION: COMPUTATION OF THE MEDIAN AND THE MEAN ABSOLUTE DEVIATION.
by James M. Dobbie. 27 Feb 63, 8p Working Memo-120

Descriptors: (*Binomials, *Statistical analysis), Distribution theory, Inventory analysis.

AD-638 741 Field 12B
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D), Inc., Cambridge, Mass.
THE GRAPHICAL METHOD FOR THE ESTIMATION OF LIFETIME DISTRIBUTIONS FROM SUMMARY DATA.
24 Jan 63, 14p Working Memo-115

Descriptors: (*Graphics, *Inventory analysis), Life expectancy, Replacement theory, Inventory control.

A graphical method has been developed to obtain a rough estimate of the lifetime distribution of an item in a system where no detailed history of the system is available. Only summary information on installation, scrap, and replacement is known. The estimate of the lifetime distribution produced can be used to predict the number of replacements required by the system. The system to be analyzed is assumed to be composed of identical units. Each unit has one or more items whose failure and replacement are of interest. For simplicity, in this discussion, each unit will be assumed to have only one item of interest. Installation and scrapping of units, and failure with replacement of items, are observed in discrete periods of time. A unit is assumed to last at least one time period after being installed before it is scrapped or removed from the system; an item lasts at least one period before it fails and is replaced. An item failing in the same period that its unit is to be scrapped will not be replaced. Since a detailed history of units and items in the system is not available, assumptions are made that the oldest unit will be the first to be scrapped, and that the item that has remained longest in the system will be the first to be replaced.

AD-638 742 Field 12B
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
SAFETY STOCK ALLOCATIONS.
by James M. Dobbie. 6 Jun 63, 10p Working Memo-136

Descriptors: (*Stock level control, *Inventory analysis), Statistical analysis, Distribution functions, Inventory control.

AD-638 743 Field 12B
CFSTI Prices: HC$2.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
MULTI-QUANTILE ESTIMATES OF THE MOMENTS OF A LOGNORMAL DISTRIBUTION.
by Stefan Peters. 8 Jul 63, 35p Working memo-142

Descriptors: (*Stochastic processes, *Distribution functions), S-matrix, Analysis of variance.

AD-638 744 Field 12B, 15E
CFSTI Prices: HC$1.00 MF$0.50
Little (Arthur D.), Inc., Cambridge, Mass.
OPTIMAL SERVICE POLICIES UNDER BUDGETARY CONSTRAINTS.
by Stefan Peters. 5 Aug 63, 20p Working Memo-146

Descriptors: (*Stock level control, *Navy budgets), Procurement, Optimization, Inventory analysis, Inventory control.

In the Navy, and possibly in some of the other defense services, the average annual size of the aggregate inventory administered by one of the supply centers is determined by budgetary rules on the basis of the aggregate demand experienced during the recent past. Similarly, the size of the personnel of such a supply center, and thereby the maximum annual number of replenishment orders which it can handle, is fixed - or at least limited - by its operational budget which is comparatively stable and, in any event, independent of the inventory policies adopted by the center. Under the current rules, the average annual inventory of each stock item in some cogs is likewise prescribed by budgetary rules so that the level of service which can be rendered by a center cannot be controlled by it through an allocation of safety stock among the various stock items under an appropriate policy. The present memorandum is concerned with developing such optimal service policies which could be applied if the latter rules were abandoned and the Navy were only to retain its present budgetary control of average annual aggregate inventories and the size of the operating personnel. (Author)

AD-638 852 Field 12B, 5A
CFSTI Prices: HC$1.00 MF$0.50
Western Management Science Inst., Univ. of California, Los Angeles.
ON STOCHASTIC LINEAR PROGRAMMING.
by Arthur M. Geoffrion. Jun 66, 20p WMSI Working Paper-103
Contract Nonr-233 (75)
Proj. NR-047-041

Descriptors: (*Stochastic processes, *Linear programming), Algorithms, Quadratic programming, Decision making, Management engineering.

The general linear programming problem is considered in which the coefficients of the objective function to be maximized are assumed to be random variables with a known multinormal distribution. Three deterministic reformulations involve maximizing the expected value, the alpha-fractile (alpha fixed, $0 < \text{alpha} < 1/2$), and the probability of exceeding a predetermined level of payoff, respectively. In this paper the author's previous work on 'bi-criterion programs' is applied to derive an algorithm for routinely and efficiently solving the second and third reformulations. A by-product of the calculations in each case is the tradeoff-curve between the criterion being maximized and expected payoff. The intimate relationships between all three reformulations are illuminated. (Author)

AD-638 954 Field 12B
Not available from CFSTI.
Oesterreichische Studiengesellschaft fuer Atomenergie, G.M.B.H., Seibersdorf. Physics Inst.
ON ERROR PROPAGATION IN THE RESOLUTION CORRECTION.
by G. Quittner. 5 Aug 65, 7p
Contract AF 61 (052)-638
AFOSR-66-1778
Availability: Published in Nuclear Instruments and Methods v39 p271-7 1966.

Descriptors: (*Errors, Experimental design), Corrections, Numerical analysis, Fourier analysis, Austria, Resolution.

If experimental functions subject to random fluctuations are replaced by appropriate smoothed versions, the appearance of spurious oscillations in

the results of resolution correction can be avoided. The truncation of series expansions of the experimental functions with respect to a suitable system of orthogonal functions is a smoothing operation of this kind. Three of such smoothing operations, for the input, for the resolution and for the output-function respectively, are introduced and some comments on their use are given. An analysis, by means of Fourier transforms, of a simplified resolution equation is used to give insight into the respective roles of the frequency spectrum of the true function, of the uncertainties of the input function and of the resolution function, and of the resolution width in determining the amount of true details in the results of measurement. Implications for the proper number of equations to be used in the solution of the resolution equation and for the choice of the resolution width in an experimental arrangement are considered. (Author)

AD-639 102 **Field 12B**
CFSTI Prices: HC$3.00 MF$0.75
California Analysis Center, Inc., Santa Monica, Calif.
SIMOPTIMIZATION RESEARCH. PHASE II.
Annual rept., 1 May 65-30 Jun 66.
by Ernel L. Lather, and Harry M. Markowitz. 15 Jul 66, 62p CACI-66-P2.0-1
Contract Nonr-4562 (00)
Projs. NR-276-102, RR 003-11-01
See also AD-627 088.

Descriptors: (*Optimization, Simulation), (*Mathematical models, Operations research), Mathematical programming, Scheduling, Statistical tests, Costs, Management planning.

Three techniques were developed during the Phase I study: the decentralized gradient approach (DGA), the linear response surface (LRS) approach, and the quadratic response surface (QRS) approach. The techniques are designed to be applied sequentially--each being more sensitive to parameter interactions than its predecessor but also more expensive in terms of computing time. The objective of the Phase II study was to test the general performance of the techniques with a more complex model than was used during Phase I and to determine the effectiveness of certain procedural modifications. The results of the empirical tests show that DGA converges quickly and efficiently to good solutions. The convergence of DGA appears to be somewhat slower than in Phase I; however, the tests also indicate that DGA can be permitted larger steps at each iteration. As in Phase I, LRS was able to find improvements in some of the final DGA solutions but the percentage improvements were smaller than previously experienced. The QRS procedure remains to be tested although a general integer quadratic programming algorithm, necessary for QRS implementation, has been postulated. The report contains a detailed discussion of the three techniques, the test model, the test results and their analysis, a presentation of a restricted version of the integer quadratic programming algorithm, and a summary of the Phase I study. (Author)

AD-639 168 **Field 12B**
CFSTI Prices: HC$3.00 MF$0.75
Operations Research Center, Univ. of Calif., Berkeley.
SOME INEQUALITIES FOR SINGLE SERVER QUEUES.
Research rept.
by Kneale Thomas Marshall. Aug 66, 76p ORC-66-19
Contract Nonr-222 (83)
Projs. NR-047-033, RR-033-07-01

Descriptors: (*Inequalities, *Queueing theory), Measure theory, Operations research, Statistical distributions.

The expected wait in the Gl/G/1 queue is related to the mean and variance of the idle time. For arrival distributions which are IFR or have mean residual life bounded by 1/lambda, simple bounds are obtained which give, for example, the expected number in queue to within at most one customer. By equating input with output, relations between random variables are used to obtain expressions for the moments of the waiting time in terms of moments of the inter-arrival, service, and idle time distributions. By bounding the idle time moments, bounds are obtained on the mean and variance of the waiting time, the mean length of a busy period, and the probability an arrival finds the system empty. Bounds on the mean wait lead to bounds on the expected virtual wait. Similar results are obtained for some generalizations of the G1/G/1 queue, including batch arrivals, batch service and priority queues. Queues where the first customer in each busy period has some added delay are also considered. Some preliminary results for tandem queues are given. (Author)

AD-639 465 **Field 12B**
CFSTI Prices: HC$1.00 MF$0.50
Northwestern Univ., Evanston, Ill. Technological Inst.
ON A SPECIAL CLASS OF CONSTRAINED GENERALIZED MEDIAN PROBLEMS.
Systems research memo.
by Abraham Charnes, Michael J. L. Kirby, and William M. Raike. Apr 66, 22p SRM-155
Contracts Nonr-1228 (10), DA-31-124-ARO (D)-322
Prepared in cooperation with Chicago Univ., Ill.

Descriptors: (*Linear programming, Uncertainty), Decision theory, Probability.

Identifiers: Chance-constrained programming.

By means of elementary properties of the absolute value function, important properties of a special class of 'constrained generalized median' problems (and eventually, the most general class, vide Charnes, Cooper, Thompson) such as existence of solutions, gradient and incremented formulae, linear programming and probabilistic interpretations are obtained for all classes of joint distribution functions for which the problems make sense. Results of A. C. Williams and R. Wets obtained by involved arguments and sophisticated constructs appear, when corrected, as special instances of some of the above results but devoid of the interrelations and interpretations adduced. (Author)

AD-639 470 **Field 12B**
Not available from CFSTI.
Western Management Science Inst., Univ. of California, Los Angeles.
A MODIFIED DYNAMIC PROGRAMMING METHOD FOR MARKOVIAN DECISION PROBLEMS.
by James B. MacQueen. 1966, 10p WMSI-Reprint-32
Contract Nonr-233 (75)
Availability: Published in Journal of Mathematical Analysis and Applications v14 n1 p38-43 Apr 1966.

Descriptors: (*Dynamic programming, Algorithms), (*Statistical processes, Dynamic programming), Decision theory.

AD-639 591 **Field 12B**
CFSTI Prices: HC$2.00 MF$0.50
Hebrew Univ., Jerusalem (Israel). Dept. of Mathematics.
AN APPLICATION OF NON-STANDARD ANALYSIS TO GAME THEORY.
Research memo.
by Eugene Wesley. Jul 66, 31p RM-20
Contract N62558-4355
Projs. NR-047-045, RR-003-0701
Rept. on Research Program in Game Theory and Mathematical Economics.

Descriptors: (*Game theory, *Real numbers), Analysis.

An extended (non-archimedean) real number system is used as a tool to prove certain theorems in the theory of cooperative games. The games discussed in this report involve a denumerably infinite number of players. Theorems concerning the nature of the kernel of such games are presented. (Author)

N66-24943 **Field 12B**
CFSTI Prices HC$2.00 MF$0.50
Rand Corp., Santa Monica, Calif.
TOLERANCE AND CONFIDENCE LIMITS FOR CLASSES OF DISTRIBUTIONS BASED ON FAILURE RATE.
by R. E. Barlow, and F. Proschan. Mar 66, 40p NASA-CR-71310, RM-4914-NASA
Contract NASR-21/11/

Descriptors: Class, Confidence, *Confidence limit, Decrease, Distribution, *Failure, Increase, Limit, *Mathematical statistics, Mathematics, Population, Rate, Reliability, Statistics, *Tolerance.

For abstract, see S 04 13.

N66-24964 **Field 12B**
CFSTI Prices HC$1.00 MF$0.50
Stanford Univ., Calif.
DENUMERABLE STATE MARKOVIAN DECISION PROCESSES - AVERAGE COST CRITERION TECHNICAL REPORT NO. 86.
by C. Derman. 28 Feb 66, 25p NASA-CR-74784
Contract NONR-225/53/
Supported In Part By Nasa, Army, And Af

Descriptors: Computer, Control, Cost, Decision, *Decision theory, Dynamic, *Dynamic programming, Markov, *Markov process, Optimal, Process, Sequence, *Sequential control, Theorem, Theory.

For abstract, see S 04 13.

N66-34627 **Field 12B**
CFSTI Prices HC$2.00 MF$0.50
Columbia Univ., New York.
A PRIMAL METHOD FOR MINIMAL COST FLOWS WITH APPLICATIONS TO THE ASSIGNMENT AND TRANSPORTATION PROBLEMS TECHNICAL REPORT NO. 32.
by M. Klein. 1 Jun 66, 33p NASA-CR-77273
Contract NONR-266/55/
Sponsored In Part By Nasa

Descriptors: Analysis, Assignment, Cost, *Cost estimate, Estimate, Flow, Graph, Linear, *Linear programming, Network, Programming, Theory, Transportation.

For abstract, see S 04 20.

N66-34674 **Field 12B**
CFSTI Prices HC$1.00 MF$0.50
Research Triangle Inst., Durham, N. C.
A GENERAL METHOD FOR THE CALCULATION OF AXIS-CROSSING MOMENTS TECHNICAL REPORT NO. 5.
by M. R. Leadbetter. Jun 66, 15p NASA-CR-77340, SU-181
Contract NONR-4565/00/
Sponsored In Part By Nasa

Descriptors: Axis, Calculation, Crossing, Distribution, Equation, Moment, *Moment distribution, Nonstationary, Normal, Number, *Probability, Process, Stationary, Stochastic, *Stochastic process.

For abstract, see S 04 20.

N66-34805 **Field 12B**
CFSTI Prices HC$1.00 MF$0.50
Stanford Univ., Calif.
A SOLUTION TO A COUNTABLE SYSTEM OF EQUATIONS ARISING IN MARKOVIAN DECISION PROCESSES TECHNICAL REPORT NO. 89.

by C. Derman, and A. F. Veinott Jr. 7 Jul 66, 15p
NASA-CR-77373, AD-635144
Contract NONR-225/53/

Descriptors: Control, Decision, *Decision making, Inventory, *Inventory control, *Markov process, Optimal, *Optimal control, Part, Process, Rule, Solution, Supply.

For abstract, see S 04 20.

PB-172 874 **Field 12B**
CFSTI Prices: HC$1.60 MF$0.50
Stanford Univ., Calif. Graduate School of Business.
ALGORITHMIC EQUIVALENCE IN LINEAR FRACTIONAL PROGRAMMING.
Technical rept.
by Harvey M. Wagner, and John S. C. Yuan. Aug 66, 12p TR-17
Grant NSF-GS-552

Descriptors: (*Linear programming, *Algorithms), Matrix algebra.

AD-638 723 **See Field 17G**

AD-638 850 **See Field 5A**

D-638 952 **See Field 5A**

AD-638 956 **See Field 5A**

AD-638 992 **See Field 5A**

AD-639 301 **See Field 9B**

PB-170 561 **See Field 13F**

13A. AIR CONDITIONING, HEATING, LIGHTING, AND VENTILATING

AD-638 974 **Field 13A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
CALCULATIONS OF HIGH-STRESS HEAT EXCHANGER.
by P. I. Povarnin. 31 Aug 66, 13p FTD-HT-66-426
TT-66-62245
Unedited rough draft trans. of mono. Issledovanie Teploobmena v Potokakh Zhidkosti i Gaza, Moscow, 1965 p167-74.

Descriptors: (*Heat exchangers, Heat transfer), Coolants, Stresses, Mathematical analysis, USSR.

N66-34937 **Field 13A**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYSIS OF HEAT-REJECTION CHARACTERISTICS OF SPACE RADIATOR PANELS UTILIZING SHARED FINS.
by M. A. Colaluca, H. C. Haller, and S. Lieblein.
Aug 66, 35p NASA-TN-D-3598
Contract 120-27-04-36-22

Descriptors: Circuit, Device, Equation, Fin, Fluid, Heat, *Heat rejection device, *Panel, Puncture, Radiator, Rejection, Space, *Space radiator, Transfer, Tube.

For abstract, see S 04 20.

PB-172 965 **Field 13A, 20D**
CFSTI Prices: HC$1.60 MF$0.50
Central Mechanical Engineering Research Inst., Durgapur (India).
INFLUENCE OF TEMPERATURE-DEPENDENT FLUID PROPERTIES ON HEAT TRANSFER IN CO-AXIAL TUBE HEAT EXCHANGER.
by B. K. Ray. Nov 65, 13p CMERI-B1

Descriptors: (*Heat exchangers, *Fluid mechanics), Heat transfer, Mechanical engineering, India.

From a collection of technical literature it is shown that specific heat and overall heat transfer co-efficient of various gases can be expressed approximately as linear functions of temperature of the fluids undergoing heat transfer. In case of linear fluid properties, a general equation is worked out describing the temperature of both the fluids. Suggestions are forwarded for the solution of this highly nonlinear differential equation. Some particular cases are discussed, one of which is suitable for better design of fire tube boilers. (Author)

AD-639 244 **See Field 13J**

AD-639 245 **See Field 13J**

AD-639 396 **See Field 10B**

13B. CIVIL ENGINEERING

PB-170 966 **Field 13B, 8H**
CFSTI Prices: HC$11.60 MF$0.75
Johns Hopkins Univ., Baltimore, Md. Dept. of Sanitary Engineering and Water Resources.
SYNTHESIS OF THE INLET HYDROGRAPH.
Technical rept. on Storm Drainage Research Project.
by John C. Schaake Jr. Jun 65, 119p TR-3

Descriptors: (*Drainage, *Civil engineering), Storms, Rainfall, Mathematical prediction, Hydrology.

This report presents a general method for synthesizing the hydrograph of runoff from an impervious area. From a known pattern of rainfall storm, and a certain geometry of the area with an accurately determined roughness coefficient, the inlet (surface water drainage inlet) hydrograph can be computed through direct routing of the overland flow. The basic equations used are the continuity equation and the dynamic equation for gradually varied unsteady flow. The computed inlet hydrographs of several small rectangular shaped impervious drainage areas showed good agreement with those measured. Sensitivity test of the computed hydrograph to changes of the roughness coefficient was investigated. Comparison of this method with several existing methods was made. (Author)

PB-170 989 **Field 13B, 20D**
CFSTI Prices: HC$4.00 MF$1.00
National Bureau of Standards, Washington, D. C.
PROGRESS REPORT ON HYDRAULICS OF CULVERTS NONENLARGED BOX CULVERT INLETS (5th).
by John L. French. 2 Jun 66, 129p NBS-9327, 0539
Proj. NBS-213.32-12-2130436
Prepared in cooperation with Bureau of Public Roads, Washington, D. C., Contract CPR11-6528.

Descriptors: (*Roads, *Drainage), (*Civil engineering, Drainage), (*Pipes, Drainage), Hydraulic models, Underground structures, Hydrodynamics.

The hydraulic capacities of box culverts operating with flow control at the inlet were investigated by use of scale models. The effects of barrel shape, wingwall flare angle and skew of inlet on capacity were established for present types of box culverts and expressed in energy equations relating rate of flow to barrel dimensions and headwater depth. Improved capacity was obtained by use of bevels at the inlet edges and by relocation of wingwalls. The dimensions required for improvement of capacity are reported. (Author)

PB-170 999 **Field 13B, 13C, 8G**
CFSTI Prices: HC$3.00 MF$0.75
Puerto Rico Dept. of Public Works, San Juan. Soils Investigation Section.
CONSTRUCTION-MATERIAL RESOURCES OF THE CAROLINA QUADRANGLE, PEURTO RICO.
by A. O. Perry, and P. A. Gelabert. 1963, 66p
Geologic Investigations Bull-1
Prepared in cooperation with U. S. Department of Commerce, Bureau of Public Roads.

Descriptors: (*Roads, Materials), (*Rock (Geology), *Puerto Rico), Limestone, Sandstone, Silt, Igneous rock, Construction.

The geologic units exposed in the quadrangle are rocks of Cretaceous, Tertiary, and Quaternary age. The Cretaceous rocks out-cropping in the hills at the southern border of the quadrangle are lavas, crystalline limestone, tuffaceous sandstone, and siltstone. Tertiary rocks are exposed in the east-west trending ridges between the towns of Canovanas and Loiza Aldea, in Los Cerros del Comandante, and in the southeastern corner of the quadrangle south of Highway Number 3. These rocks are composed of; alternating beds of soft-chalky limestone and hard crystalline limestone, a siltstone formation, and an igneous intrusive. The Quaternary surficial deposits cover approximately eighty percent of the land area. These deposits consist mainly of alluvium, alluvial terraces, beach deposits, eolianite, and swamp deposits. Construction materials are available in the Carolina quadrangle for use as concrete aggregate, subgrade and embankment material, highway aggregate, riprap, and dimension stone. At the present time, there are ten pits and quarries operating in the quadrangle. (Author)

PB-172 450 **Field 13B, 13C**
CFSTI Prices: HC$3.00 MF$0.75
Wyoming State Highway Dept. Planning and Research Div.
PROCEDURE MANUAL FOR STATEWIDE MATERIALS LOCATION SURVEY.
Revised ed.
7 Oct 64, 74p
Availability: Original document in color until exhausted.

Descriptors: (*Roads, Materials), (*Wyoming, Roads), Construction, Rock (Geology), Aerial photography, Maps, Structural geology.

The study includes developing procedures, using existing maps, records, geology, geomorphology, air photo information, test pit and drill excavations to locate new sources and extend existing sources of material for highway construction. The study includes strips forty miles wide along the Interstate Highway System and strips twenty miles wide along the Primary and Secondary Highway Systems. It also includes the Federal Aid Secondaries that are not yet included on the State Highway System.

PB-172 453 **Field 13B**
CFSTI Prices: HC$5.00 MF$1.00
Virginia Council of Highway Investigation and Research, Charlottesville.
CHARLOTTE COUNTY RESEARCH PROJECT PART II, PHASE I BASIC FACTORS SECONDARY ROAD STUDY.
1952, 142p

Descriptors: (*Roads, *Virginia), Soils, Aerial photography, Photointerpretation.

Contents: Description of county; Road system; Pedology; Airphoto interpretation applied to Charlotte County; Soil sampling, testing and classification; Soil profiles and their application in engineering.

PB-172 857 **Field 13B**
CFSTI Prices: HC$1.60 MF$0.50
Public Health Service, Washington, D. C.

AIR POLLUTION AS RELATED TO AGRICULTURAL AND INDUSTRIAL DEVELOPMENT.
by Lester Goldner. 28 Mar 66, 11p
Prepared for presentation at the Annual Meeting of the American Railway Development Association (57th), White Sulphur Spring, West Virginia, March 28, 1966.

Descriptors: (*Air pollution, Economics), Agriculture, Industrial production, Ecology, Public health.

PB-173 064 **Field 13B**
CFSTI Prices: HC$5.00 MF$1.00
Southern California Labs., Stanford Research Inst., South Pasadena.
ANANALYSIS OF INTERCITY PASSENGER TRAFFIC MOVEMENT WITHIN THE CALIFORNIA CORRIDOR THROUGH 1980.
Final rept.
by William L. Metzger, and Howard R. Ross. Apr 66, 189p
Contract FA-65-WA-1344
Proj. SRI-SEU-5589
FAA-ADS-75

Descriptors: (*Traffic, *California), Analysis, Passenger vehicles, Transportation, Mathematical prediction.

The objectives of the study were: to project passenger traffic between 13 selected city-pair markets within the Corridor, to allocate this traffic among the various modes of transportation, and to assess future technological developments in intercity surface transportation systems within the Corridor, and the ways in which these developments might change the competitive positions of these systems. All types of surface transport systems were examined, including systems now serving these markets as well as proposed new types of high-speed systems. Allocations of future traffic to the various modes were based on the assumption that future air service in the markets will be provided exclusively by conventional fixed-wing jet aircraft. (Author)

PB-173 146 **Field 13B**
CFSTI Prices: HC$2.00 MF$0.50
Mississippi Univ., University. Experiment Station.
THE RESPONSE TO QUESTIONNAIRE PORTION OF REPORT NO. 1; PRELIMINARY REPORT, CONTROL OF PAVEMENT MOVEMENTS ADJACENT TO STRUCTURES.
Special rept.
15 Feb 65, 26p Rept. no. 2

Descriptors: (*Pavements, Motion), (*Expansion joints, Pavements), Damage, Roads, Bridges, Structures, Maintenance, Reinforcing materials, Design, Effectiveness, Mississippi.

The following two major questions wwere posed: 1. How prevalent is damage to structures from movement of rigid pavements in your State. 2. What action has been taken or considered to control, prevent or repair damage to structures from pavement movement. A summary of the replies to the questionnaire showed that damage to structures is very prevalent in 5 States, prevalent in 6, occasional in 13, rare in 7 and nonexistent in 15. Of this latter group, 11 highway departments reported very few rigid pavements in their States. An attempt to correlate the gravity of the problem with climatic and geological conidtions was largely unsuccessful. Prominent among the favcors mentioned as contributing to the problem were expansive aggregate, alkali-aggregate reaction, infiltrated solids in transverse joints, and downhill creep of pavement. The most popular method of dealing with the problem is relief by cutting out a strip of pavement near the bridge ends and filling the gap with a comprssible material. Twenty-foure States indicated the use of this method, with the widths of the cut-outs varying from 4 inches to 4 feet. Ten States have used some form of end anchorage to restrain pavement movement, particularly in conjunction with continuously reinforced pavement. Several States reported satisfactory results with a series of doweled 1-inch expansion joints. Other, rather unique preventative methods were reported. (Author)

PB-173 150 **Field 13B, 5J, 17B**
CFSTI Prices: HC$2.00 MF$0.50
National Proving Ground for Freeway Surveillance Control and Electronic Traffic Aids, Detroit, Mich.
THE ABILITIES AND LIMITATIONS OF HUMAN OBSERVERS OF A CLOSED CIRCUIT TELEVISION FREEWAY SURVEILLANCE SYSTEM.
by Seymour E. Bergsman. Apr 66, 46p

Descriptors: (*Traffic, Visual inspection), (*Television communication systems, Traffic), (*Visual perception, Performance (Human)), (*Michigan, Traffic), Roads, Control systems, Training, Psychometrics.

The major significant differences revealed by the study were between individual observers. That is, individual differences were generally greater than other differences. These differences between observers became much more significant after the first week. One possible explanation for this was that the first week was a training or learning period while the last three weeks were a functioning or working period. Another conclusion was that training and experience are extremely important in improving and maintaining the efficiency of observers.

PB-173 151 **Field 13B**
CFSTI Prices: HC$2.00 MF$0.50
National Proving Ground for Freeway Surveillance Control and Electronic Traffic Aids, Detroit, Mich.
AN EVALUATION OF FREEWAY RAMP CLOSURE.
by Edward F. Gervais, and Walter Roth. 1966, 50p

Descriptors: (*Traffic, Control), (*Roads, Traffic), (*Michigan, Traffic), Detectors, Television communication systems, Visual inspection, Volume, Velocity.

Identifiers: Highway ramps.

The objective of the study was to determine the effect of on-ramp closure on freeway traffic flow. A week-long test of the effect of on-ramp closure on freeway traffic flow was conducted. The three week period prior to the study week was used to establish control values of volumes; stoppage frequency, duration, and length; and speeds. The traffic parameters recorded during the week of testing were compared with the control values. Ramp closure was obtained through use of ramp closure signs and policeman stationed at the head of the entrance ramps. Traffic parameters were measured through use of the television surveillance equipment, overhead detectors, and strategically placed study views. The results of the study inicated short time ramp closures resulted in an increase in peak hour volumes, a substantial decreased in the number of stoppages, a large reduction in the lenght of stopped queue, and an increase in average speeds. Diverted vehicles were rerouted to another on-ramp to the freeway.

PB-173 155 **Field 13B, 13L**
CFSTI Prices: HC$1.00 MF$0.50
Michigan Dept. of State Highways.
ANTI-GLARE SCREEN STUDY.
STS-0159
Mar 66, 18p
Prepared in cooperation with the Bureau of Public Roads, Washington, D. C.

Descriptors: (*Roads, Shielding), (*Shielding, Light), Safety devices, Metals, Effectiveness, Safety, Installation.

An observational study of ALCOA expanded metal glare screen as installed in a 10-foot median of a divided freeway and in the divider strip between a freeway and a two-way service road. Daylight photographs are included to show the appearance of the glare screen. Nighttime photographs show how the screen effectively cuts out the opposing headlights. Some information on maintenance problems is given. (Author)

PB-173 159 **Field 13B, 5J, 5E**
CFSTI Prices: HC$3.00 MF$0.75
National Proving Ground for Freeways Surveillance, Control and Electronic Traffic Aids, Detroit, Mich.
PEAK PERIOD COMFORT AND SERVICE EVALUATION OF AN URBAN FREEWAY AND AN ALTERNATE SURFACE STREET.
Comparative research proj.
by Vasant H. Surti, and Edward F. Gervais. Jan 66, 68p STS-0283
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Descriptors: (*Michigan, Roads), (*Roads, Michigan), (*Motor vehicle operators, Stress (Psychology)), (*Stress (Psychology), Motor vehicle operators), Human engineering, Galvanic skin response, Psychometrics, Traffic, Performance (Human).

Data were collected on the John C. Lodge Freeway in Detroit utilizing GSR (Galvanic Skin Response) and Drivometer equipment. An attempt was made to determine a comfort index utilizing the normalized scores of (1) steering reversals (2) speed changes (3) accelerator reversals (4) brake applications (5) number of responses on the GSR and (6) the magnitude of GSR responses; a service index was formulated using the variables included in the Comfort Index above and adding a travel time variable with a weight equal to the other six variables. The results of the study indicate that both the comfort index and the service index provide a measure of the level of service of the facility.

PB-173 160 **Field 13B**
CFSTI Prices: HC$3.00 MF$0.75
National Proving Ground for Freeway Surveillance, Control and Electronic Traffic Aids, Detroit, Mich.
THE RELATIONSHIPS OF VEHICLE CLASSIFICATION AND GEOMETRIC CHARACTERISTICS TO PEAK PERIOD FREEWAY VOLUMES.
Cooperative research proj.
by Vasant H. Surti. Jan 66, 60p STS-0284
Prepared in cooperation with Bureau of Public Roads, Washington, D. C.

Descriptors: (*Roads, Traffic), (*Traffic, Analysis of variance), (*Michigan, Roads), Passenger vehicles, Cargo vehicles, Volume, Classification, Mathematical prediction.

At various locations on the John C. Lodge Freeway, individual lane volume and vehicle classification counts were made during the a.m. and p.m. peak traffic hours. As a result of this data: (1) A classified vehicle distribution by vehicle type and lane distribution was made in which a higher percentage of passenger cars were found in the median and center lanes, while most commercial vehicles were in the shoulder lane. An exception to these findings was found in the vicinity of some entrance and exit ramps. (2) A correlation analysis of individual lane volume, total volume, distance to ramps, time of day and commercial vehicles is made with the highest degree of correlation found between individual lane volume and total volume. (3) Linear regression models are developed in order to predict individual lane volumes and total volumes on the freeway.

PB-173 161 **Field 13B, 13F**
CFSTI Prices: HC$1.00 MF$0.50
South Dakota Dept. of Highways. Research and Planning Div.

MOTOR VEHICLE MEDIAN CROSSING EXPERIENCE STUDY ON INTERSTATE HIGHWAYS I-90 AND I-190 IN SOUTH DAKOTA.
1965, 17p

Descriptors: (*Roads, South Dakota), (*Traffic, South Dakota), (*South Dakota, Roads), Passenger vehicles, Operation.

Identifiers: Medians (Roads).

The report summarizes the sighted median crossings of a moving observer. The observer while driving a continuous patrol of a nineteen mile section of Interstates 90 and 190 near Rapid City, South Dakota, recorded 103 sighted median crossings. These crossings are expanded by an unvalidated method to 1004 median crossings per million vehicles-miles of travel. Of the observed crossings, 95 percent were made by passenger cars and pickup trucks. Fifty-five percent of all crossings occurred at maintenance crossovers. (Author)

PB-173 168 **Field 13B, 5J**
CFSTI Prices: HC$1.00 MF$0.50
California Univ., Los Angeles. Inst. of Transportation and Traffic Engineering.
TANGENTIAL OFF-RAMPS ON FREEWAYS.
Final rept.
by Harry W. Case. Dec 65, 12p RR-43

Descriptors: (*Roads, Design), (*Motor vehicle operators, Behavior), Visual signals, Simulation, Reaction (Psychology).

Identifiers: Highway interchanges, Highway signs.

Three tangential off-ramps were shown to over 200 subjects. The ramps were filmed under nonremedial conditions and with two types of signs (pavement signs and exit signs) in the remedial condition. The data were analyzed in terms of the steering responses made at the off-ramps.

PB-173 169 **Field 13B, 5C, 8F**
CFSTI Prices: HC$3.00 MF$0.75
Iowa Highway Commission. Div. of Planning.
NEWTON ECONOMIC STUDY, INTERSTATE 80 BYPASS.
Jan 66, 89p
Availability: Original document in color until exhausted.

Descriptors: (*Roads, Economics), (*Economics, Roads), Traffic, Safety, Iowa, Commerce.

Identifiers: Bypass routes, Highways.

The study provides information about the economic, traffic, highway safety and land use effects of the bypass of Newton, Iowa, by Interstate 80. The bypass of Newton by Interstate 80 has not deterred the commercial growth of the community nor has it adversely affected the economy of Newton as a whole. Growth is indicated by new commercial developments along the highway, including a 27 unit shopping center, three service stations, three new automobile dealers show rooms and garages, etc. In addition, new motel, service station and restaurant accommodations are planned in the near future. The Newton area is being affected by the spatial shrinkage that may result from the construction of a new highway system. Interstate 80 has provided Newton residents with a modern, convenient and time-saving route to the large shopping centers of Des Moines, only thirty miles away. This has put the local merchants in competition with the larger metropolitan shopping centers. While this may hinder Newton's growth in retail sales to some extent, the researchers conclude that the present industrial, commercial and residential growth in Newton has provided the city with a sound foundation for continued economic growth.

PB-173 173 **Field 13B, 9B**
CFSTI Prices: HC$6.00 MF$1.25
Bureau of Public Roads, Washington, D. C.
CONFERENCE ON IMPROVED HIGHWAY ENGINEERING PRODUCTIVITY, COLUMBUS, OHIO, MAY 3-4, 1966 PROCEEDINGS.
1966, 263p

Descriptors: (*Roads, Symposia), Engineering, Civil engineering, Transportation, Traffic, Computers, Data processing systems, Design.

Identifiers: Highways.

Contents: Computer applications for engineering problems in Kansas, Electronic devices as traffic aids, Automated optimum design of structural systems, Development of sonic and ultrasonic power devices for application in highway engineering, The engineer - evolution of a new breed, Overview of activities, Development in allied modes of transportation, Trends in computing, Advanced methods for control and right-ofway surveys, Computer program for highway design, Use of analytical stereoplotter ap/c in highway engineering, Introduction to panel discussion on optical scanning, Optical character recognition, The control data 915 optical character page reader, Optical character recognition, Progress on total integrated engineering system, Integrated computer program for pier design, Appalachian development and demonstration project of integrated engineering procedures.

PB-173 221 **Field 13B, 13F**
CFSTI Prices: HC$4.00 MF$0.75
Highway Research Board, Washington, D. C.
TRAFFIC VOLUME AND SPEED STUDIES.
1961, 103p Bull-281
Presented at the Annual Meeting (39th), January 11-15, 1960.

Descriptors: (*Traffic, Urban areas), (*Sampling, Traffic), Volume, Velocity, Measurement, Roads, Vehicles, Illinois, Pennsylvania, Michigan.

Identifiers: Chicago, Pittsburgh.

CONTENTS: Estimating the daily vehicle-miles of travel in the Chicago and Pittsburgh metropolitan areas, by Louis E. Keefer; Estimating traffic volumes by systematic sampling, by Thomas Muranyi; Volume and speed characteristics at seven study locations, by Frederick A. Wagner, Jr., and Adolf D. May, Jr.; Sample size requirements for vehicular speed studies, by J. C. Oppenlander, W. F. Bunte, and P. L. Kadakia; Variability of fixed-point speed measurements, by Robert P. Shumate and Richard F. Crowther.

PB-173 222 **Field 13B, 9C**
CFSTI Prices: HC$4.00 MF$0.75
Highway Research Board, Washington, D. C.
ELECTRONICS IN TRAFFIC OPERATIONS.
1962, 106p Bull-338
Presented at the Annual Meeting (41st), January 8-12, 1962.

Descriptors: (*Traffic, *Electronics), (*Roads, Electronics), Detection, Control, Automatic, Velocity, Measurement.

Contents: Detection and location of off-the-shoulder vehicles; Comments on an electronic highway - test roadway; Electronic highway aid system; Vehicle guidance and speed control system; Pilot study of the automatic control of traffic signals by a general purpose electronic computer; Traffic pacer; Intersection traffic control through coordination of approach speed; Traffic measurement - determination of number and weight of vehicles.

PB-173 223 **Field 13B, 13F, 9C**
CFSTI Prices: HC$3.00 MF$0.75
Highway Research Board, Washington, D. C.
DRIVING SIMULATORS AND APPLICATION OF ELECTRONICS TO HIGHWAYS.
1960, 63p Bull-261
Presented at the Annual Meeting (39th), January 11-15, 1960.

Descriptors: (*Passenger vehicles, Operation), (*Roads, Control systems), Simulators, Electronic equipment, Scientific research, Digital systems.

CONTENTS: Driving simulator research, by Slade Hulbert and Charles Wojcik; Engineering and psychological uses of a driving simulator, by Bernard H. Fox; Some technical considerations in driving simulation, by Bernard H. Fox; Standard electronic units interconnect to provide flexible digital recording, by Richard C. Hopkins; Electronic highways, by Joseph B. Bidwell, Albert F. Welch and Eugene A. Hanysz.

PB-173 226 **Field 13B, 5D**
CFSTI Prices: HC$4.00 MF$1.00
Highway Research Board, Washington, D. C.
A COLLOQUY ON MOTOR VEHICLE AND TRAFFIC LAW.
1965, 134p SR-86
A compilation of paper, commentary and discussions sponsored by the Committee on Motor Vehicle and Traffic Law, Highway Research Board, February 2-3, 1965.

Descriptors: (*Traffic, *Law), (*Passenger vehicles, Law), Accidents, Engineering, Control.

Law, public policy and the administrative process; Highway accidents; Traffic and engineering technology; Traffic regulation and the administration of justice.

PB-173 227 **Field 13B**
CFSTI Prices: HC$5.00 MF$1.00
Highway Research Board, Washington, D. C.
AN INTRODUCTION TO TRAFFIC FLOW THEORY.
by D. L. Gerlough, and D. G. Capelle. 1964, 157p SR-79

Descriptors: (*Traffic, Theory), Dynamics, Passenger vehicles, Simulation, Acceleration, Noise.

Contents: Hydrodynamic approaches, Car following and acceleration noise; Queueing theory approaches; Simulation of traffic flow, Experiments and applications.

PB-173 231 **Field 13B**
CFSTI Prices: HC$3.00 MF$0.75
Highway Research Board, Washington, D. C.
ELECTRONIC TRAFFIC SURVEILLANCE AND CONTROL. FIVE REPORTS.
1963, 83p Record-10
Presented at the Annual Meeting (42nd), January 7-11, 1963.

Descriptors: (*Traffic, Control systems), (*Control systems, Economics), Transportation, Counting methods, Automatic, Television equipment, Scientific research, Passenger vehicles, Safety.

CONTENTS: An anti-rear-end collision system, by William B. Roeca, Jr., and Adam C. Thomas; Long-range research and development program for individual transportation systems, by Richard C. Hopkins, et. al.; A multistation, centralized digital traffic-counting system, by Ara M. Baltayan and Ludwig Pallat; Automatic traffic counters, by C. J. Crawford and A. E. Russell; Television equipment for traffic surveillance, by Charles L. Richard and Keith Bushnell.

AD-464 881 **See Field 4A**

PB-170 998 **See Field 8G**

PB-173 092 **See Field 11B**

PB-173 171 See Field 5F

PB-173 219 See Field 13L

PB-173 220 See Field 13F

PB-173 224 See Field 13F

PB-173 228 See Field 13F

PB-173 229 See Field 5J

PB-173 230 See Field 5J

PB-173 232 See Field 13L

13C. CONSTRUCTION EQUIPMENT, MATERIALS, AND SUPPLIES

NBS-BSS-6 See Field 11B

PB-170 999 See Field 13B

PB-172 450 See Field 13B

13D. CONTAINERS AND PACKAGING

AD-638 882 Field 13D
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
OXYGEN GASIFIER FOR PROLONGED MAINTENANCE OF LIQUID OXYGEN UNDER PRESSURE.
by G. I. Voronin, and M. V. Zolotukhin. 18 Apr 66, 5p FTD-TT-65-1740
Unedited rough draft trans of Patent (USSR) 168 735, appl. 837399/23-26, 18 May 63.

Descriptors: (*Oxygen, Liquefied gases), (*Liquefied gases, *Storage tanks), Patents, Pressure vessels, Tanks (Containers), Pressure regulators, Thermal insulation, Heat transfer.

The object of the invention is an oxygen gasifier for prolonged maintenance of the liquid oxygen under pressure, consisting of a thick-walled vessel with heat insulation, a system of gasification, and regulation of the pressure, to prevent over-heating the liquid oxygen at the walls of the vessel and its premature evaporation, the vessel has arranged inside of the inner cavity heat bridges with little thermal resistance.

AD-638 925 Field 13D
CFSTI Prices: HC$3.00 MF$0.75
Douglas Aircraft Co., Inc., Santa Monica, Calif. Missile and Space Systems Div.
STRESS ANALYSIS OF A 4-INCH DIAMETER PRESSURE VESSEL DURING A 1:1 BIAXIAL BURST TEST.
by R. W. McIver. 23 Jun 66, 65p DAC-59500

Descriptors: (*Pressure vessels, Stresses), Rupture, Tests, Cylindrical bodies.

The investigation was made to determine the variation of stress ratio in the test section of a 4-inch diameter pressure vessel. A 1:1 biaxial test was conducted by applying a combination of pressure and axial load at an essentially constant ratio to the test cylinder until failure. The stress ratio was determined at each of twenty-one locations from measured principal strains. The maximum variation in yield strength at any of the nine centermost locations in the test section was less than plus or minus 1.5 percent of their average. This specimen configuration is considered acceptable for 1:1 biaxial tests, provided that the thinnest area of the specimen is located close to the axial center-line of the test section. (Author)

N66-25323 Field 13D
CFSTI Prices HC$2.00 MF$0.50
Deutsche Versuchsanstalt Fur Luft- Und Raumfahrt, Porz (West Germany).
CONTRIBUTION TO THE DEVELOPMENT OF LIQUID- LEVEL-INDICATION FOR FUEL TANKS FILLED WITH AGGRESSIVE LIQUIDS STANDING UNDER HIGH GAS PRESSURE.
Beitrag Zur Entwicklung Einer Fullstandsanzeige Fur Behalter Mit Aggressiven Flussigkeiten, Die Unter Hohem Gasdruck Stehen
by J. Thelen, W. Trommsdorff, and H. Wiegand. Feb 66, 29p DVL-468, DLR-MITT.-66-01
In German, English Summary

Descriptors: Capacitance, *Capacitive fuel gauge, Fuel, *Fuel gauge, Gas, Gauge, High pressure, *Indicator, Level, Liquid, *Liquid level, Propellant, *Propellant tank, Tank.

For abstract, see S 04 13.

N66-35278 Field 13D
CFSTI Prices HC$1.00 MF$0.50
Osterreichische Studiengesellschaft Fur Atomenergie G.m.b.h., Seibersdorf (Austria).
A HIGH PRESSURE VESSEL FOR THE MEASUREMENT OF PRESSURE INDUCED PHONON ENERGY SHIFTS BY INELASTIC SCATTERING OF NEUTRONS.
by R. Lechner. 28 Apr 66, 25p SGAE-PH-43/1966
Submitted For Publication

Descriptors: Alloy, Aluminum, Energy, High pressure, *Inelastic scattering, Inelasticity, Measurement, Neutron, *Neutron scattering, *Phonon, Pressure, *Pressure vessel, Scattering, Shift, Vessel.

For abstract, see S 04 20.

13E. COUPLINGS, FITTINGS, FASTENERS, AND JOINTS

AD-639 317 Field 13E
CFSTI Prices: HC$3.00 MF$0.50
Materials Research Lab., Inc., Richton Park, Ill.
INTERPHASE FRACTURING OF COMPOSITE BODIES.
Final rept., 1 Apr 65-1 Apr 66.
by Sheldon Mostovoy, and E. J. Ripling. Sep 66, 56p
Contract NOw-65-0372

Descriptors: (*Bonded joints, Fracture (Mechanics)), Epoxy plastics, Adhesives, Aluminum alloys, Glass, Laminates, Fatigue (Mechanics), Toughness, Defects (Materials).

Cracking location for short time tests in the Dow epoxy resin (DER) 332, TEPA adhesive was found to depend on composition. At specific ratios of resin to hardener the crack path changed from center of bond (CoB) to interface (IF), depending on adherend material and surface treatment. For compositions where CoB fractures predominate, precracked specimens exposed at zero stress, to either atmospheric humidity or liquid water, showed reinitiation toughness values higher than those seen in prior running or subsequent extension. This toughening is probably a result of the compressive stresses developed in the epoxy by water absorption around the crack tip. Static fatigue exposure of normally CoB precracked specimens was found to cause significant slow crack extension at loads well below those required for rapid extension in short time tests. Debonding occurred starting at one IF directly in line but separated from the preexisting crack. Propagation rates increased as either applied load or humidity was increased. Dynamic fatigue exposure of similarly CoB precracked specimens also showed slow IF crack extension from the initial flaw. Rates of crack extension per cycle for this loading condition were found to be linear, increasing as stress amplitude or humidity was increased. Effects of a given maximum load and humidity were much more severe in the dynamic fatigue case than in the static.

AD-639 619 Field 13E, 20K, 13J
CFSTI Prices: HC$4.00 MF$0.75
Battelle Memorial Inst., Columbus, Ohio.
INVESTIGATION OF RESIDUAL STRESSES IN STEEL WELDMENTS.
Final rept.
by Koichi Masubuchi, and D. C. Martin. Sep 66, 109p
Contract NObs-92521
Proj. SR-167
SSC-194
Rept. on Investigation of Residual Stresses in Steel Weldments.

Descriptors: (*Ship hulls, Welds), (*Steel, Stresses), (*Welds, Steel), Welding, Fracture (Mechanics), Stress corrosion, Hydrogen embrittlement, Metallography.

Identifiers: Steel HY-80, Steel 4340.

Experimental hydrogen-induced-cracking tests were made on 45 weldments in mild steel, HY-80 steel, a commercial high-strength structural steel, and SAE 4340 steel. Extensive cracks were found in weldments made in SAE 4340 steel (oil quenched and tempered at 500 F) after hydrogen charging for relatively short times. Systematic crack patterns that could be related to residual stress distributions were obtained on various complex weldments. When steels of lower strengths were used, longer charging time was required to produce cracks, and crack patterns were less pronounced. The hydrogen-induced-cracking technique does not seem to work on mild-steel weldments. It has been found that hydrogen-induced cracking is stress sensitive rather than plastic-strain sensitive. This has been proved by hydrogen-induced-cracking tests on mechanically stress-relieved specimens and press-fit specimens in which residual stresses were produced by purely elastic deformation. It was found that distributions of residual stresses in mild-steel and SAE 4340 steel weldments were quite similar despite the considerable differences in the yield strengths of the two base plates and the weld metals. This was proved in butt joints up to 38 inches long and complex welded structures. (Author)

13F. GROUND TRANSPORTATION EQUIPMENT

N66-24967 Field 13F
CFSTI Prices HC$2.00 MF$0.50
Bendix Corp., Ann Arbor, Mich. Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SURVEYOR LUNAR ROVING VEHICLE, PHASE I. VOLUME I - PROGRAM SUMMARY FINAL TECHNICAL REPORT.
Apr 64, 28p NASA-CR-71257, BSR-903
Contracts NAS7-100, JPL-950656
Prepared For Jpl

Descriptors: Analysis, Antenna, Design, Direction, Engineering, Landing, Lunar, *Lunar surface vehicle, Model, Payload, Soft, *Soft landing, Spacecraft, Surface, *Surveyor project, System, Test, Vehicle.

For abstract, see S 04 13.

PB-170 561 Field 13F, 12B
CFSTI Prices: HC$3.00 MF$0.75
Hughes Aircraft Co., Fullerton, Calif. Transportation Research Project Office.
LITERATURE SURVEY ON THE COMMAND AND CONTROL OF HIGH-SPEED GROUND ORIENTED TRANSPORTATION SYSTEMS.
Mar 66, 56p FR-66-11-65
Revision of FR65-11-281.

Descriptors: (*Reviews, Transportation), (*Command ; control systems, *Transportation), Railroads, State-of-the-art reviews, Bibliographies.

PB-170 945 Field 13F
CFSTI Prices: HC$1.60 MF$0.50
Ekonomisk Foretagsledning, (EF) AB, Stockholm (Sweden).
AUTOMOTIVE SERVICE AND REPAIR EQUIPMENT IN SWEDEN.
Apr 64, 17p

Descriptors: (*Passenger vehicles, *Maintenance equipment), Sweden, Maintenance, Spare parts, Small tools.

The present market among existing, organized, privately owned repair shops is calculated as about 10 million dollars a year. The market growth is roughly the same as the increase in number of cars, or about 10% a year. Most equipment - with exception for hand tools - is imported. The duty is 10% with only small variations. For EFTA-Countries the duty is at the moment reduced by 60%. American products were dominating this market from 1945 to 1955. During the fifties Great Britain took an ever larger part (Great Britain is by tradition Sweden's foremost trade partner). Since then West-Germany, Denmark, Italy, France and Austria have all taken a share of the market. The American share of total sales is to-day estimated to be between 10 and 20%, i.e. $1,5-3 mill. The main reasons for the U. S. loss of market share have been inefficient service organization and high prices. Another drawback has been the use of untranslated booklets and instructions. In general the Swedish repair shops are very well equipped and rather efficient. There are 180 shops with more than 25 mechanics each, and this category takes over an ever greater part of the work.

PB-173 220 Field 13F, 13B, 13L
CFSTI Prices: HC$4.00 MF$0.75
Highway Research Board, Washington, D. C.
MOTOR VEHICLE SPEED, VOLUME, WEIGHT AND TRAVEL TIMES.
1961, 125p Bull-303
Presented at the Annual Meeting (40th), January 9-13, 1961.

Descriptors: (*Traffic, Vehicles), (*Safety, Traffic), Velocity, Weight, Time, Roads, Urban areas, Mississippi, Pennsylvania, North Carolina, Volume, Analysis, Data, Motor vehicle accidents, Visual signals, Statistical analysis.

CONTENTS: Effect of speed limit signs on speed on suburban arterial streets, by Curt M. Elmberg and Harold L. Michael; Effects on speed and accidents of improved delineation at three hazardous locations, by L. D. Powers and H. L. Michael; Application of mechanical analysis to traffic recorder data, by J. A. Head and R. C. Blensly; Some statistical evaluations of truck weight characteristics in Mississippi, by Boris B. Petroff and J. H. Sumners; A study of urban travel times in Pennsylvania cities, by Robert R. Coleman; Effects of commercial roadside development on traffic flow in North Carolina, by J. W. Horn, P. D. Cribbins, J. D. Blackburn and C. E. Vick, Jr.; Development and use of maximum-car technique for measuring travel time, by P. D. Cribbins, J. W. Horn and C. E. Vick, Jr.; An analysis of urban travel times and traffic volume characteristics, by C. Dwight Hixon.

PB-173 224 Field 13F, 13B
CFSTI Prices: HC$3.00 MF$0.75
Highway Research Board, Washington, D. C.
MOTOR VEHICLE TIME AND FUEL CONSUMPTION.
1960, 99p Bull-276
Presented at the Annual Meeting (39th), January 11-15, 1960.

Descriptors: (*Cargo vehicles, *Fuel consumption), Operation, Velocity, Time, Performance (Engineering), Roads, Transportation, Towing vehicles.

CONTENTS: Fuel and time consumption rates for trucks in freight service, by Malcolm F. Kent; Time and fuel consumption for highway user benefit studies, by Paul J. Claffey; Motor transport fuel consumption rates and travel time, by Roy B. Sawhill and Joseph C. Firey.

PB-173 225 Field 13F
CFSTI Prices: HC$3.00 MF$0.75
Highway Research Board, Washington, D. C.
VEHICLE CHARACTERISTICS.
1962, 60p Bull-334
Presented at the Annual Meeting (41st), January 8-12, 1962.

Descriptors: (*Passenger vehicles, Velocity), (*Cargo vehicles, Velocity), Fuel meters, Fuel consumption, Time.

CONTENTS: An analysis of speed changes for large transport trucks, by Joseph C. Firey and Edward W. Peterson; Predicting fuel consumption and travel time of motor transport vehicles, by Roy B. Sawhill and Joseph C. Firey; and Fuel meter model FM 200, by William C. Kieling.

PB-173 228 Field 13F, 13B
CFSTI Prices: HC$3.00 MF$0.75
Highway Research Board, Washington, D. C.
MOTOR VEHICLE USE CHARACTERISTICS. THREE REPORTS.
1963, 86p Record 26
Presented at Annual Meeting (42nd) 7-11 Jan 63.

Descriptors: (*Cargo vehicles, Weight), (*Specifications, Cargo vehicles), (*Traffic, *Passenger vehicles), New York, New Jersey, Towing vehicles, Towed vehicles.

CONTENTS: Comparisons of empty and gross weights of commercial vehicles, by Laurence L. Liston and Stanley F. Bielak; Dimensions and weights of highway trailer combinations and trucks-1959, by Malcolm F. Kent and Hoy Stevens; Trends and forecasts of auto trips across the Hudson River screenline in New York-New Jersey metropolitan area, by Nathan Cherniack.

PB-173 161 See Field 13B

PB-173 221 See Field 13B

PB-173 223 See Field 13B

13H. INDUSTRIAL PROCESSES

AD-458 324 Field 13H, 7D
CFSTI Price: HC$2.60
Royal Aircraft Establishment, Farnborough (England).
THE THEORY OF SINTERING BY VOLUME OR SURFACE-DIFFUSION.
by D. Gibey, N. J. Wadsworth, and Rosalie Brandon. Nov 64, 30p Technical rept. TR-64068

Descriptors: (*Sintering, Theory), (*Surfaces, Diffusion), (*Volume, Diffusion), Metals, Differential equations, Mathematical analysis, Mathematical models, Great Britain.

A brief summary is made of the theory of the sintering of two spheres or of a sphere and a plane by either volume-diffusion or surface-diffusion. The previous theories of Kuczynski and Cabrera are considered and following an analysis of some of the approximations involved it is found that the growth of the major neck radius, X, with time, t, can be summarized by X to the nth power/ r to the mth power = At, where r is the sphere radius and n = 5, m = 2 for a volume-diffusion mechanism or n = 7, m = 3 for a surface-diffusion mechanism. A is a constant given in terms of the geometrical and physical constants for the two mechanisms and the two cases of sphere-plane and sphere-sphere sintering. (Author)

AD-638 749 Field 13H, 14B, 11F
CFSTI Prices: HC$4.00 MF$0.75
Army Materials Research Agency, Watertown, Mass. Materials Technology Div.
A REPORT GUIDE TO ULTRASONIC TESTING LITERATURE. VOLUME II.
Monograph series.
by Ernest H. Rodgers, and Charles P. Merhib. Jun 66, 121p
AMRA-MS-66-05
See also AD-630 652.

Descriptors: (*Bibliographies, Non-destructive testing), (*Non-destructive testing, *Ultrasonic radiation), Test methods, Ultrasonic properties, Attenuation.

The main objective of this compilation is to provide a simple and fast access to information on the subject of ultrasonic testing and also to provide sufficient information in the form of abstracts and word descriptors to make the listing useful.

AD-638 886 Field 13H
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
METHOD OF ATTACHING WIRE TRANSDUCERS UNDER HYDROSTATIC PRESSURE.
by Yu D. Mazur-Dzhurilovskii. 28 Jun 66, 5p
FTD-TT-65-1941
Unedited rough draft trans. of Patent (USSR) 169 160, appl. 743039/23,29 Aug 61.

Descriptors: (*Transducers, Bonding), Patents, Wire, Hydrostatic pressure, Manufacturing methods, Adhesives, Strain gages, Pressure vessels, Tanks (Containers).

The object of the invention is a method of attaching wire transducers under hydrostatic pressure by polymerized glues. The part with the strain gage to be glued on is first placed in a rubber envelope filled with loose material and then in a chamber with high pressure.

AD-639 153 Field 13H, 11C, 21B
CFSTI Prices: HC$2.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
AUTOMOBILE INDUSTRY: SELECTED ARTICLES.
6 Jun 66, 31p FTD-TT-65-1856
TT-66-62282
Unedited rough draft trans. from Avtomobilnaya Promyshlennost (USSR) pp37-40, 45-7 1964 (sic).

Descriptors: (*Automotive industry, USSR), (*Plating, *Chromium), (*Engine starters, *Ignition systems), Effectiveness, Piston rings, Pickling.

RELATIVE EFFECTIVENESS OF VARIOUS TYPES OF CHROMIUM COATINGS: Conclusions: Dense chromium coating after knurling possesses good antifriction properties. Dense coating after knurling has high wear resistance and wears off little of the surface conjugated with it. Dense coating protects the detail against corrosion. The process of dense chromium plating after knurling is technologically simple, while the process of porous chromium plating is carried out by a strictly definite regime and the slightest deviations from same lead to a reduction in antifriction and wear resistant properties of the given coating. HIGH ENERGY IGNITION SYSTEM FOR STARTING A GAS TURBINE ENGINE: Conclusions: to improve starting characteristics of a gas turbine engine it is advisable to use a low voltage ignition system of high energy capacitance type (10-12 joules.) The use in the Rotaks ignition system of additional throttle inductance allows to increase the time of flow through of the discharge current through the spark plug and to improve the ignitability of the discharge. (Author)

AD-639 212 Field 13H, 9A
CFSTI Prices: HC$3.00 MF$0.75
Aeroprojects, Inc., West Chester, Pa.
ULTRASONIC WELDING PROCESS AND EQUIPMENT FOR CONSTRUCTION OF ELECTRON-TUBE MOUNTS.

by John G. Thomas. Jun 66, 68p
Contract DA-36-039-sc-86741
Weld Evaluation Rept. on Metallurgical Examination of Welds on Finished Tubes.

Descriptors: (*Ultrasonic welding, *Electron tubes), Electron tube parts, Manufacturing methods, Performance (Engineering), Failure (Electronics), Tests.

The sample lot of 100 Type 6080WB electron tubes, fabricated as the end-product of this program, was subjected to heater-cycling, shock, fatigue, 2000-hour life, stability and survival, and electrical acceptance tests. After testing, tubes were examined physically and metallographically to determine cause of failure. Of the 35 failures, 7 rejects were attributable to weld defects. Failures due to inadequacies in this first effort with ultrasonic welding tooling can be minimized or eliminated through further optimization of the special tooling beyond that provided for under the scope of this program. These results demonstrate the potential capability of the ultrasonic welding process in electron-tube manufacture. (Author)

AD-639 314 **Field 13H, 11F**
CFSTI Prices: HC$3.00 MF$0.75
Massachusetts Inst. of Tech., Cambridge. Metals Processing Lab.
DEFORMATION PROCESSING OF ANISOTROPIC METALS.
Final rept., 1 Jul 65-30 Jun 66.
by W. A. Backofen, D. L. Holt, D. Lee, P. Martin, and F. J. Azzarto. Jul 66, 100p
Contract NOw-66-0068

Descriptors: (*Mechanical working, Metals), (*Metals, Plasticity), (*Alloys, Plasticity), Eutectics, Aluminum alloys, Copper alloys, Titanium alloys, Zirconium alloys, Lead, Tin, Electrodeposition, Extrusion, Magnesium alloys.

Contents: Superplasticity in the Al-Cu eutectic alloy, Superplasticity in some titanium and zirconium alloys, Superplasticity in electroplated composites of lead and tin, Superplasticity in pellet- and ingot-extrusions of the magnesium alloy ZK60.

AD-639 440 **Field 13H, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
DEVICE FOR GLUING ELECTRIC RESISTANCE TENSOMETERS TO METAL CONSTRUCTIONS.
by A. E. Mandelshtam, and A. S. Ilin. 28 Jun 66, 5p FTD-TT-65-1942
Unedited rough draft trans. of Patent (USSR) 169 161, Appl. no. 873182/23-4, 28 Dec 63.

Descriptors: (*Tensiometers, *Bonding), USSR, Patents, Heating, Adhesives, Heating elements, Polymerization, Metals.

The object of the invention is a device for gluing on electrical resistance tensometers to metallic constructions by means of heating a polymerizing glue layer to accomplish an effective polymerization of the glue composition from the side of the metal construction. It is designed in the form of nichrome spirals arranged in a flat metallic body covered with an organosilicon electrical-insulation composition with a central opening corresponding to the gluing of the tensometer. (Author)

N66-24120 **Field 13H**
CFSTI Prices HC$2.00 MF$0.50
Solar, San Diego, Calif.
DEVELOPMENT OF BRAZING PROCESSES FOR PYROLYTIC GRAPHITE FINAL REPORT, 1 MAY 1965 - 1 MAR. 1966.
by R. G. Bogowitz, J. V. Long, and A. G. Metcalfe. 18 Mar 66, 39p NASA-CR-71768, RDR-1453
Contracts NAS7-100, JPL-950717
Prepared For Jpl

Descriptors: *Brazing, Buckling, Chamber, Cooling, Expansion, Joint, Lap, *Lap joint, Loading, Metal, *Pyrolytic graphite, Radiation, Refractory, Scarf, Shear, Stress, Tantalum, Thrust.

For abstract, see S 04 13.

N66-25006 **Field 13H**
CFSTI Prices HC$4.00 MF$1.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE MAKING OF TITANIUM AND TITANIUM-ALLOY SHAPES BY CASTING, POWDER METALLURGY, AND OTHER PROCESSES.
by V. D. Barth, E. T. Hall, J. G. Kura, H. Mc curdy, and H. O. Mc intire. 18 Apr 66, 133p NASA-TM-X-53437, RSIC-471
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Alloy, *Casting, Chemical, Deposition, *Electroforming, Metal, *Metal spraying, Metallurgy, Powder, *Powder metallurgy, Spraying, Titanium, *Titanium alloy, Vapor, *Vapor deposition.

For abstract, see S 04 13.

N66-25007 **Field 13H**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MECHANICAL FASTENING OF TITANIUM AND ITS ALLOYS.
by D. L. Cheever, R. E. Keith, D. C. Martin, and R. E. Monroe. 20 Apr 66, 77p NASA-TM-X-53442, RSIC-502
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Airframe, Alloy, Design, *Fastener, *Forming, *Joint, *Machining, Mechanical, Mechanics, Metallurgy, Structural, Titanium, *Titanium alloy.

For abstract, see S 04 13.

N66-25008 **Field 13H**
CFSTI Prices HC$3.00 MF$0.50
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE CASTING AND POWDER-METALLURGY FORMING OF PRECIPITATION-HARDENABLE STAINLESS STEELS.
by V. D. Barth, J. G. Kura, and H. O. Mc intire. 20 Apr 66, 54p NASA-TM-X-53444, RSIC-491
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Aluminum, *Casting, Forming, Grade, Hardening, Metallurgy, Powder, *Powder metallurgy, Precipitation, *Precipitation hardening, Stainless, *Stainless steel, Steel, Technique, Titanium.

For abstract, see S 04 13.

N66-25009 **Field 13H**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HEAT TREATMENT OF TITANIUM AND TITANIUM ALLOYS.
by F. F. Schmidt, and R. A. Wood. 20 Apr 66, 77p NASA-TM-X-53445, RSIC-493
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Alloy, Elongation, *Hardness, Heat, *Heat treatment, Mechanical, Metallurgy, Notch, Property, Strength, *Structural material, Tensile, *Tensile strength, Thermal, Titanium, *Titanium alloy, Treatment.

For abstract, see S 04 13.

N66-25010 **Field 13H**
CFSTI Prices HC$3.00 MF$1.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SURFACE TREATMENTS FOR NICKEL AND NICKEL-BASE ALLOYS.
by A. M. Hall, and C. M. Jackson. 20 Apr 66, 152p NASA-TM-X-53448, RSIC-513
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Alloy, *Diffusion, *Electroplating, Hardening, Hardness, Lubrication, Nickel, *Nickel alloy, Peening, Surface, *Surface treatment, Treatment.

For abstract, see S 04 13.

N66-25034 **Field 13H, 11F**
CFSTI Prices HC$1.00 MF$0.50
Neratoom, N. V., The Hague (Netherlands).
METHODS IN THE FABRICATION OF PRESSURE VESSELS QUARTERLY REPORT NO. 14, 1 JUL. - 30 SEP. 1965.
1 Oct 65, 13p EURAEC-1473, EUR-2394
Contract EURATOM-069-61-12 RDN
Transl. Into English From The Dutch

Descriptors: Arc, *Arc welding, *Carbon dioxide, Chromium, Fabrication, Gas, Metal, Molybdenum, Nickel, Pressure, Property, Structure, Tensility, Vessel, *Welded structure, Welding.

For abstract, see S 04 13.

N66-25113 **Field 13H**
CFSTI Prices HC$1.00 MF$0.50
Institut De Soudure, Paris (France).
WELDED JOINTS ON HEAVY GUAGE STEEL SHEETS QUARTERLY REPORTS 4 AND 5, 1 APR. - 30 SEP. 1965.
29 Nov 65, 19p EURAEC-1518, EUR-2670
Contract EURATOM-007-64-TEEF/RD/
Transl. Into English From French

Descriptors: Groove, Joint, Metal, *Metal plate, Method, Oxygen, Plate, Sheet, *Steel, *Welded joint, Welding.

For abstract, see S 04 13.

N66-25533 **Field 13H**
CFSTI Prices HC$4.00 MF$1.00
Oklahoma State Univ., Stillwater.
STUDY OF FILTRATION MECHANICS AND SAMPLING TECHNIQUES, PHASE II TECHNICAL SUMMARY REPORT, 1 JAN. - 31 DEC. 1965.
by P. Dransfield, K. L. Stone, and R. H. Tucker. 1 Mar 66, 129p NASA-CR-74853
Contract NAS8-11009

Descriptors: Cloth, *Contaminant, Contamination, Design, Filter, *Filtration, Flow, Housing, Impurity, Mesh, Oil, Oxide, Pleated, Pressure, Silicon, *Silicon oxide, Sintering, Wire, *Wire mesh.

For abstract, see S 04 14.

N66-25572 **Field 13H**
CFSTI Prices HC$3.00 MF$0.75
Trw Equipment Labs., Cleveland, Ohio.
STRETCH-FORMED ALUMINUM SOLAR CONCENTRATOR.

Apr 66, 80p NASA-CR-66069, TRW-ER-6819
Contract NAS1-4684

Descriptors: Accuracy, *Aluminum, Coefficient, *Concentrator, Design, Fabrication, Forming, Mount, Optical, Reflection, Reflector, Ring, Solar, *Solar reflector, Stretch, *Stretch forming, Technique.

For abstract, see S 04 14.

N66-25583 Field 13H
CFSTI Prices HC$3.00 MF$0.75
Avco Corp., Lowell, Mass.
INVESTIGATION OF 3- D FABRICATION OF ABLATIVE MATERIALS QUARTERLY PROGRESS REPORT NO. 1, 8 SEP. - 7 DEC. 1965.
by C. T. Hughes, R. W. King, W. Kyros, E. M. Lenoe, and P. J. Roy. 2 Dec 65, 63p NASA-CR-65353
Contract NAS9-5207

Descriptors: *Ablating material, Ablation, Epoxy, *Fabric, Material, Mechanical, Phenol, *Reinforced material, Reinforcement, Resin, Sewing, Shock, Textile, Thermal, Tuft, Weaving.

For abstract, see S 04 14.

N66-25823 Field 13H
CFSTI Prices HC$5.00 MF$1.00
Chalmers Univ. Of Technology, Goteborg (Sweden).
DIFFUSION AND CAPTURE OF ARGON IN NEUTRON IRRADIATION FROM CALCIUM FLUORIDE. THE PROBLEM OF THE TRANSPORT PROCESS AND DAMAGES FROM RAYS IN FIXED BODIES.
Diffusion Und Einfang Von Argon In Neutronenbestrahltem Kalziumfluorid. Zum Problem Der Transportvorgange Und Der Strahlenschaden In Festkorpern
by T. Lagerwall. 1965, 153p
In German, English Summary Its Trans. No. 307

Descriptors: *Argon, Atom, Bombardment, Calcium, *Calcium fluoride, Coefficient, Crystal, Damage, *Diffusion, Fluoride, Interstitial, Lattice, Neutron, *Neutron bombardment, Radiation, Single, *Single crystal, Solubility, Thermodynamics.

For abstract, see S 04 14.

N66-26052 Field 13H
CFSTI Prices HC$1.00 MF$0.50
Comitato Nazionale Per L Energia Nucleare, Frascati (Italy).
PRESENT STATE OF TECHNIQUES OF CONSTRUCTING SUPERCONDUCTING MAGNETS.
Stato Attuale Delle Tecniche Di Costruzione Di Magneti Superconduttori
by G. Pasotti, N. Sacchetti, G. Sacerdoti, and G. Sanna. 11 Mar 66, 18p LNF-66/13
In Italian Its Nota Interna No. 312

Descriptors: Alloy, Application, Cryogenics, Current, Ductility, Field, Gallium, Graph, Magnetic, *Manufacturing, Niobium, Physics, Resistance, Solenoid, *Superconducting magnet, Superconductor, Table, Transverse, Vanadium, *Zirconium alloy.

For abstract, see S 04 14.

N66-26230 Field 13H
CFSTI Prices HC$5.00 MF$1.00
Southwest Research Inst., San Antonio, Tex.
DEVELOPMENT OF WELDING TECHNIQUES AND FILLER METALS FOR HIGH STRENGTH ALUMINUM ALLOYS ANNUAL SUMMARY REPORT, 27 JUN. 1964 - 27 JUN. 1965.
by H. C. Burghard Jr, N. G. Lenamond, A. L. Lowenberg, J. Mc donald Jr, and E. B. Norris. 11 Oct 65, 155p NASA-CR-74992
Contract NAS8-1529

Descriptors: Alloy, Aluminum, *Aluminum alloy, *Filler, High strength, *High strength alloy, Loading, Mechanical, Metal, Process, Property, Technique, Test, *Welding.

For abstract, see S 04 14.

N66-26238 Field 13H
CFSTI Prices HC$3.00 MF$0.75
General Electric Co., Cleveland, Ohio.
DEVELOPMENT OF FABRICATION PROCESS FOR METALLIC FIBERS OF REFRACTORY METAL ALLOYS SIX MONTH PROGRESS REPORT.
by F. R. Adams, L. H. Amra, L. F. Chamberlain, G. J. Polanka, and J. F. Tavernelli. 20 Jan 66, 99p NASA-CR-75015
Contract NAS3-7906

Descriptors: Alloy, Fabrication, Fiber, Hafnium, Metal, Molybdenum, Niobium, Process, Production, Refractory, *Refractory alloy, Tantalum, Titanium, *Wire, Zirconium.

For abstract, see S 04 14.

N66-26239 Field 13H
CFSTI Prices HC$3.00 MF$0.75
Westinghouse Electric Corp., Baltimore, Md.
INSTRUCTION MANUAL FOR EPITAXIAL APPARATUS.
by J. L. Halsor. 30 Sep 65, 74p NASA-CR-74954
Contract NAS5-3758

Descriptors: Apparatus, Compound, *Crystal growth, Deposition, Dioxide, Electronic, *Etching, Instruction, Laboratory, *Laboratory apparatus, *Manual, Nucleation, *Nucleation process, Operation, Process, Programmer, Silicon, *Silicon compound, Single, Site, Treatment, Valve.

For abstract, see S 04 14.

N66-26265 Field 13H
CFSTI Prices HC$2.00 MF$0.50
Boeing Co., Seattle, Wash.
AN ANALYSIS OF ETCHANT EFFECTS ON PENETRANT PERFORMANCE.
by F. J. Musil. 1965, 30p NASA-CR-75001, T5-6539-2
Contract NAS8-5608

Descriptors: Bonding, Boundary, *Crack, *Detection, *Etching, Failure, Flaw, Grain, *Inspection, Manual, Metallurgy, Penetration, *Welding.

For abstract, see S 04 14.

N66-26277 Field 13H
CFSTI Prices HC$6.00 MF$1.25
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MACHINING AND GRINDING OF ULTRA-HIGH-STRENGTH STEELS AND STAINLESS STEEL ALLOYS.
by F. W. Boulger, J. A. Gurklis, and C. T. Olofson. Oct 65, 229p NASA-TM-X-53433, RSIC-501
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Alloy, Belt, Chemistry, Electricity, Electrochemistry, Etching, *Grinding, *Machining, *Metallurgy, Stainless, *Stainless steel, Steel.

For abstract, see S 04 14.

N66-26278 Field 13H
CFSTI Prices HC$7.00 MF$2.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DEFORMATION PROCESSING OF TITANIUM AND ITS ALLOYS.
by F. W. Boulger, T. G. Byrer, A. F. Gerds, and D. E. Strohecker. 18 Apr 66, 361p NASA-TM-X-53438, RSIC-420
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Alloy, Bar, *Deformation, Extrusion, Forging, *Metallurgy, Rolling, Sheet, Titanium, *Titanium alloy, Tube.

For abstract, see S 04 14.

N66-26279 Field 13H
CFSTI Prices HC$4.00 MF$0.75
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MECHANICAL FASTENING OF NICKEL-BASE ALLOYS.
by D. L. Cheever, D. C. Martin, and R. E. Monroe. 20 Apr 66, 101p NASA-TM-X-53441, RSIC-509
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Alloy, Bolt, Boundary, Corrosion, Design, *Fastener, Grain, Joint, Liquid, Metal, *Metallurgy, Nickel, *Nickel alloy, Processing, Riveting.

For abstract, see S 04 14.

N66-26280 Field 13H
CFSTI Prices HC$5.00 MF$1.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MACHINING AND GRINDING OF NICKEL-BASE AND COBALT-BASE ALLOYS.
by F. W. Boulger, J. A. Gurklis, and C. T. Olofson. 20 Apr 66, 157p NASA-TM-X-53446, RSIC-482
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Abrasive, Alloy, Band, Belt, Chemical, Cobalt, *Cobalt alloy, Electrolysis, *Grinding, *Machining, *Metallurgy, Nickel, *Nickel alloy, Saw.

For abstract, see S 04 14.

N66-26281 Field 13H
CFSTI Prices HC$5.00 MF$1.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
JOINING OF NICKEL AND NICKEL-BASE ALLOYS.
by R. M. Evans, D. C. Martin, R. E. Monroe, and J. J. Vagi. 20 Apr 66, 167p NASA-TM-X-53447, RSIC-484
Contract NASA ORDER H-76715, DA-01-021-AMC-11651/Z/
Prepared By Battelle Mem. Inst. Under Subcontract From Army Missile Command

Descriptors: Alloy, Arc, Brazing, Fusion, *Joint, Metal, Metallurgy, *Nickel, Preparation, Soldering, Solid, State, Welding.

For abstract, see S 04 14.

N66-26654 Field 13H
CFSTI Prices HC$1.00 MF$0.50
Iit Research Inst., Chicago, Ill.
ENVIRONMENTAL STUDY OF MINIATURE SLIP RINGS QUARTERLY REPORT NO. 11, 1 JAN. - 1 APR. 1966.
by O. M. Kuritza. 1966, 15p NASA-CR-75119, E6000-32
Contract NAS8-5251

Descriptors: Atmosphere, Brush, Gold, High vacuum, Ion, *Lubrication, Miniature, Nickel, Nitrogen, Noise, Overlay, Pump, *Ring, Slip, Spectrography, *Sublimation, Technique.

For abstract, see S 04 14.

N66-26696 **Field 13H**
CFSTI Prices HC$1.00 MF$0.50
Republic Aviation Corp., Farmingdale, N. Y.
DESIGN, DEVELOPMENT, MANUFACTURE, AND DELIVER NEW CONCEPTS FOR HIGH ENERGY RATE FORMING SYSTEM QUARTERLY REPORT NO. 3.
by B. Leftheris. Apr 65, 24p NASA-CR-75032, RAC-2788-2
Contract NAS8-11811

Descriptors: Air, Beam, Coil, Conversion, Cylinder, Dome, Driver, Electric, Electromagnetic, Electron, Energy, *Energy conversion, Forming, High energy, Loading, Plate, Potential, *Potential energy, Pressure, Strain, *Transducer, Wave, Welding.

For abstract, see S 04 14.

N66-26703 **Field 13H**
CFSTI Prices HC$3.00 MF$0.75
Republic Aviation Div., Fairchild Hiller Corp., Farmingdale, N. Y.
DEVELOPMENT OF TOOLING, PRODUCTION PROCEDURES, AND PRODUCTION OF 57-INCH BULKHEADS FINAL REPORT, JUL. 1964 - DEC. 1965.
by G. Pfanner. 1965, 99p NASA-CR-75066, FHR-3232
Contract NAS8-11500

Descriptors: Alloy, *Aluminum alloy, *Bulkhead, Chemical, Die, Drawing, Ellipsoid, Fabrication, Fiberglass, Flange, Forming, Heat, Liquid, *Liquid oxygen (lox), Lox, Metal, *Metal forming, Milling, Oxygen, Pressurization, Ratio, Seal, Stretch, Tank, Treatment.

For abstract, see S 04 14.

N66-34126 **Field 13H**
CFSTI Prices HC$7.00 MF$2.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
STRUCTURAL ADHESIVE BONDING CONFERENCE.
14 Mar 66, 363p NASA-TM-X-57823
Papers Presented At Conf. Held At Huntsville, Ala., 15-16 Mar. 1966

Descriptors: Adhesive, *Bonding, Bulkhead, Coating, *Conference, Construction, Core, Cryogenic, Design, Honeycomb, Insulation, Material, Nondestructive, Plastic, Process, Sandwich, Structural, *Structural design, Structure, Technology, Testing.

For abstract, see S 04 20.

N66-34443 **Field 13H**
CFSTI Prices HC$2.00 MF$0.50
Clark (David) Co., Inc., Worcester, Mass.
DEVELOPMENT AND EVALUATION OF PRESSURE SEALING CLOSURE SIX MONTHLY PROGRESS REPORT.
Oct 63, 28p NASA-CR-65452
Contract NAS9-1186

Descriptors: Assembly, *Closure, Clothing, Development, Equipment, Flight, *Flight clothing, Gas, Gemini project, Leakage, Material, Mechanics, Neoprene, Pressure, *Pressurized suit, Prototype, Rate, *Sealing, Space, Suit.

For abstract, see S 04 20.

N66-35050 **Field 13H**
CFSTI Prices HC$3.75 MF$1.25
Electro-optical Systems, Inc., Pasadena, Calif.
DEVELOPMENT AND TESTING OF POROUS IONIZER MATERIALS, PART I SUMMARY REPORT, FEB. 1965 - MAY 1966.
by K. Butler, G. Kuskevics, M. La chance, B. Thompson, and H. Todd. 1 Sep 66, 224p NASA-CR-54707, EOS-6650
Contract NAS3-7103

Descriptors: Additive, Cesium, Contact, Copper, Development, Engine, Evaluation, Fabrication, Ion, *Ionization, Ionizer, Material, *Material testing, Metal, Porosity, *Porous material, Propulsion, Testing, *Tungsten.

For abstract, see S 04 20.

N66-35217 **Field 13H**
CFSTI Prices HC$4.25 MF$1.75
Westinghouse Electric Corp., Lima, Ohio.
BORE SEAL TECHNOLOGY TOPICAL REPORT.
by P. E. Kueser, R. C. Mc rae, and J. W. Toth.
Dec 66, 304p NASA-CR-54093, WAED-64.54E
Contract NAS3-4162

Descriptors: Alkali, Alloy, Aluminum, Beryllium, Bonding, Bore, Ceramic, *Ceramic bonding, Compatibility, Electric, Joining, Material, Mechanical, *Mechanical property, Metal, *Metal bonding, Niobium, Power, Property, Seal, *Sealing, Space, Testing, Thermophysical, *Thermophysical property.

For abstract, see S 04 20.

N66-35224 **Field 13H**
CFSTI Prices HC$2.00 MF$0.50
North American Aviation, Inc., Los Angeles, Calif.
TITANIUM S-IC SKIN SECTION PHASE I REPORT, 29 JUN. - 10 DEC. 1965.
by A. G. Jones. 10 Dec 65, 50p NASA-CR-77532, NA-65-1043
Contract NAS8-20530

Descriptors: Alloy, Aluminum, Bonding, Design, Diffusion, Fabrication, Fuel, *Fuel tank, Material, Molybdenum, Propellant, Roll, *Saturn s- ic stage, Section, *Skin, Structural, Tank, Test, Titanium, *Titanium alloy, Vanadium.

For abstract, see S 04 20.

N66-35230 **Field 13H**
CFSTI Prices HC$3.00 MF$0.75
North American Aviation, Inc., Los Angeles, Calif.
TITANIUM S-IC SKIN SECTION PHASE I SUPPLEMENT REPORT, 8 NOV. 1965 - 11 MAR. 1966.
by A. G. Jones. 24 Mar 66, 58p NASA-CR-77533, NA-66-57
Contract NAS8-20530

Descriptors: Control, Design, Development, *Diffusion bonding, Fabrication, Foil, *Panel, Plate, Product, *Product development, Quality, Rolling, Skin, Steel, *Titanium.

For abstract, see S 04 20.

N66-35231 **Field 13H**
CFSTI Prices HC$2.00 MF$0.50
North American Aviation, Inc., Los Angeles, Calif.
TITANIUM S-IC SKIN SECTION PHASE II REPORT, 29 NOV. - 24 DEC. 1965.
by A. G. Jones. 28 Dec 65, 39p NASA-CR-77531, NA-65-1103
Contract NAS8-20530

Descriptors: Assembly, Control, Development, Fabrication, Inspection, Panel, Product, *Product development, Quality, *Quality control, Rolling, *Skin, *Titanium, Welding.

For abstract, see S 04 20.

N66-35244 **Field 13H**
CFSTI Prices HC$2.00 MF$0.50
Pyrogenics, Inc., Woodside, N. Y.
STUDY OF THE USE OF VAPOR AND VACUUM TECHNIQUES FOR THE DEVELOPMENT OF HIGH STRENGTH FILAMENTARY MATERIALS SUMMARY TECHNICAL REPORT, 22 MAY 1965 - 21 MAY 1966.
by W. A. Robba. 1966, 46p NASA-CR-77510
Contract NASW-1201

Descriptors: Deposition, *Filament, Film, Graphite, High strength, Liquid, *Liquid metal, Metal, Pyrolysis, *Pyrolytic graphite, Substrate, Thin, *Thin film, Vacuum, Vapor, *Vapor deposition.

For abstract, see S 04 20.

PB-170 708 **Field 13H, 7A**
CFSTI Prices: HC$10.60 MF$0.75
Oulu Univ. (Finland).
A STUDY OF DYNAMIC AND CONTROL PROPERTIES OF INDUSTRIAL FLOTATION PROCESSES.
by Antti Niemi. 1966, 110p
Pub. in Acta Polytechnica Scandinavica, Chemistry including Metallurgy Series No. 48 ch 48 pl-111 1966.

Descriptors: (*Flotation, Control), Mass transfer, Two-phase flow, Simulation, Networks, Tracer studies, Pyrites, Sodium compounds, Carbonates, Dynamics, Minerals, Foams, Industrial equipment, Finland.

Identifiers: Sodium carbonate.

The transfer properties of industrial continuous flow flotation cells and cell series were studied both in time and frequency domain and appropiate mathematical expressions are derived. Based on these, the simulation and control of flotation are discussed and realizable circuits are suggested. Conditioning in the continuous flow conditioner is studied theoretically and the treatment is extended to cover conditioning with simultaneous flotation in the cells. The mass flow characteristics of flotation cells were studied experimentally by means of radioactive tracers. By fitting the results to derived models it is shown that the residence time distribution of the pulp body of the mechanical cell corresponds to that of the perfect mixer in series with a minute plug flow region. For the multiple cell the plug flow region is more pronounced. As tracer compounds chalcopyrite, Na_2CO_3, and solid tailing were used. The problems of representativeness are submitted to a thorough discussion and experimental analysis. (Author)

PB-173 254 **Field 13H**
CFSTI Prices: HC$1.00
National Bureau of Standards, Washington, D. C. Inst. for Applied Technology.
FILAMENT-WOUND CONSTRUCTION.
Sep 66, 33p OTR-140

Descriptors: (*Filament wound construction, Mechanical properties), (*Composite materials, Glass), Epoxy plastics, Plastics, Laminates, Pressure vessels, Binders, Mandrels, Rocket cases, Bibliographies, Deep submergence.

Identifiers: Reinforced plastics.

Recent Government-sponsored research covers such aspects of filament-wound construction as fundamental properties of resins and fibers, methods of producing fibers of various shapes, characteristics of different winding configurations, testing procedures, and applications of filament-wound construction. The reports contain information on

the development of theories to explain observed characteristics of resins, filaments, and types of construction as well as listing empirical test results on specific items. (Author)

AD-638 914 See Field 9A

AD-638 956 See Field 5A

AD-638 970 See Field 14B

AD-639 056 See Field 11F

AD-639 100 See Field 9E

AD-639 108 See Field 9A

AD-639 226 See Field 11B

AD-639 322 See Field 19F

AD-639 335 See Field 11F

AD-639 388 See Field 9A

AD-639 431 See Field 9A

AD-639 432 See Field 9A

AD-639 484 See Field 11F

AD-639 574 See Field 9A

AD-639 588 See Field 9A

AD-639 597 See Field 20K

AD-639 610 See Field 9A

AD-639 617 See Field 11D

PB-170 809 See Field 12A

13I. MACHINERY AND TOOLS

AD-639 152 Field 13I

CFSTI Prices: HC$1.00 MF$0.50

Foreign Technology Div., Wright-Patterson AFB, Ohio.

DEVICE FOR MEASURING THE TEMPERATURE OF THE OVERHEATING OF THE REVOLVING PARTS OF MACHINES.

by V. K. Mochalov. 28 Jun 66, 5p FTD-TT-65-1939

Unedited rough draft trans. of Patent (USSR) 168 916, appl. 890922/26-10, 20 Mar 64.

Descriptors: (*Temperature control, Photoelectric pyrometers), (*Photoelectric pyrometers, Drives), Rotation, Heating, Measurement, Stroboscopes, Armatures, Patents, USSR.

In measuring the temperature of overheating of the revolving parts of machines, for example, the disk armatures of electrical machines, with the aid of photoelectric pyrometers, it is impossible to keep out error connected with the turning of the part. The proposed device makes it possible to decrease this error. It contains an ordinary photoelectric pyrometer with a revolving cut-off and is distinguished from the known devices for the same purpose by the fact that, for improving the precision of the measurement by means of a stroboscope effect, the cut-off is provided with a drive which assures its turning synchronously with the revolving part. (Author)

N66-24604 Field 13I

CFSTI Prices HC$3.00 MF$0.75

Mechanical Technology, Inc., Latham, N. Y.

LUBRICANT LIFE TESTS ON BALL BEARINGS FOR SPACE APPLICATIONS FINAL REPORT.

by P. Lewis, and S. F. Murray. 28 Oct 65, 85p NASA-CR-71695, MTI-65TR55

Contract NAS5-9028

Descriptors: Application, Ball, *Ball bearing, Bearing, Contact, Film, Life, *Lifetime, *Lubricant, Molybdenum, *Molybdenum sulfide, Oil, Silicate, Sodium, Solid, Space, Sulfide, Test, Torque, *Vacuum.

For abstract, see S 04 13.

N66-24966 Field 13I

CFSTI Prices HC$3.00 MF$0.75

Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.

210 FT ADVANCED ANTENNA SYSTEM - REPORT ON HYDROSTATIC BEARING DAMAGE.

by W. D. Merrick, and H. P. Phillips. 8 Nov 65, 93p NASA-CR-74001

Descriptors: Accident, *Accident investigation, *Antenna, Azimuth, Bearing, Error, Human, Hydraulic, Hydrostatic, Investigation, System, Thrust, *Thrust bearing.

For abstract, see S 04 13.

N66-24977 Field 13I

CFSTI Prices HC$3.00 MF$0.50

Mechanical Technology, Inc., Latham, N. Y.

THE SOLUTION OF SPECIAL SQUEEZE FILM GAS BEARING PROBLEMS BY AN IMPROVED NUMERICAL TECHNIQUE.

by S. B. Malanoski, and C. H. Pan. Feb 66, 60p NASA-CR-74672, MTI-65TR26

Contract NAS8-11678

Descriptors: Axial, Bearing, Computer, *Computer program, Displacement, Excursion, Film, Gas, *Gas bearing, Program, Radial, Squeeze.

For abstract, see S 04 13.

N66-24995 Field 13I

CFSTI Prices HC$3.00 MF$0.50

Mechanical Technology, Inc., Latham, N. Y.

ON THE SLOWLY TIME DEPENDENT PROBLEM OF SQUEEZE FILM BEARINGS.

by T. Chiang, H. G. Elrod Jr, and C. H. Pan. Feb 66, 54p NASA-CR-74722, MTI-66TR7

Contract NAS8-11678

Descriptors: Analysis, Asymptote, Axial, *Bearing, Dependency, Dynamic, Excitation, Film, *Gyroscope, Motion, Output, Perturbation, Radial, Reaction, Spherical, Squeeze, Stability, Suspension, *Suspension system, System, Time, *Time dependency, Vibration.

For abstract, see S 04 13.

N66-25064 Field 13I

CFSTI Prices HC$3.00 MF$0.75

General Electric Co., Cincinnati, Ohio.

MATERIALS FOR POTASSIUM LUBRICATED JOURNAL BEARINGS QUARTERLY PROGRESS REPORT NO. 9, APR. 22 - JUL. 22, 1965.

by R. G. Frank. 1965, 96p NASA-CR-54892

Contract NAS3-2534

Descriptors: Bearing, Corrosion, Friction, Journal, *Journal bearing, Lubrication, *Potassium, Reaction, Space, System, Testing,.*Turbogenerator, Wear, Wetting.

For abstract, see S 04 13.

N66-26149 Field 13I

CFSTI Prices HC$2.00 MF$0.50

Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.

PRESSURE DISTRIBUTION IN A HYDROSTATIC BEARING OF MULTI-WELLS.

by S. M. Barondess, H. P. Phillips, and S. Utku. 1 Mar 63, 28p NASA-CR-74884, JPL-TM-33-119

Contract NAS7-100

Descriptors: Bearing, Computer, Differential, *Differential equation, Digital, Distribution, Equation, Fortran, Hydrostatic, *Hydrostatic pressure, *Laplace operator, Linear, Matrix, *Navier-stokes equation, Operator, Pad, Pressure, *Pressure distribution, Program, Well.

For abstract, see S 04 14.

N66-26771 Field 13I

CFSTI Prices HC$1.00 MF$0.50

Technisch Documentatie En Informatie Centrum Voor De Krijgsmacht, The Hague (Netherlands).

REVIEW OF LITERATURE ON GENERAL MACHINE DESIGN AND CONSTRUCTION.

Literatuuroverzicht Algemene Werktuigbouw 25 Apr 66, 23p

In Dutch, English, And German Its Vol. 4, No. Aw-33

Descriptors: *Abstract, Annotation, *Bibliography, Diesel, *Diesel engine, Engine, Equipment, Gas, *Gas turbine, Installation, Lubrication, *Machine tool, Seal, Steam, *Steam turbine, Tool, Turbine.

For abstract, see S 04 14.

N66-34682 Field 13I

CFSTI Prices HC$3.00 MF$0.50

Franklin Inst., Philadelphia, Pa.

DETERMINATION OF GAS BEARING STABILITY BY RESPONSE TO A STEP-JUMP INTERIM REPORT.

by T. Y. Chu, H. G. Elrod Jr, and J. T. Mc cabe. Jul 66, 53p NASA-CR-77221, I-A2049-27

Contract NONR-2342/00/

Sponsored In Part By Nasa

Descriptors: Analysis, Bearing, Duhamel theorem, Dynamic, Equation, Film, Function, Gas, *Gas bearing, Jump, Linear, Lubrication, Numerical, *Numerical analysis, Orbit, Program, *Stability, Step, *Step function.

For abstract, see S 04 20.

N66-35016 Field 13I

CFSTI Prices HC$3.00 MF$0.75

Marlin-rockwell Corp., Jamestown, N. Y.

SPIN AXIS BEARINGS SUMMARY REPORT.

by D. J. Howles, and H. E. Munson. 27 Jul 66, 77p NASA-CR-77365

Contract NAS8-5441

Descriptors: Analysis, Axis, *Bearing, Bleed, Dynamic, *Failure, Finish, Guidance, *Gyroscope, Life, Oil, Race, Spacecraft, *Spacecraft guidance, Spin, Testing.

For abstract, see S 04 20.

N66-35252 Field 13I, 20I

CFSTI Prices HC$6.00 MF$1.25

THE PLASMA GUN AND ITS APPLICATIONS.

Le Chalumeau A Plasma Et Ses Applications

by H. Marchandise. 8 Sep 66, 242p EUR-2439.F, TID-22136

Contract AT/04-3/-250

In French Prepared Jointly With Advanced Technol. Labs.

Descriptors: Arc, *Arc welding, Ceramic, Current, Cutting, Electric, *Electric arc, Electrode, Flow, Gas, *Gas flow, Gun, High temperature, Jet, Metal, Plasma, *Plasma gun, Powder, Spacing, Spraying, Voltage, Welding.

For abstract, see S 04 20.

N66-24870 See Field 11H

13J. MARINE ENGINEERING

AD-638 726 Field 13J

CFSTI Prices: HC$6.00 MF$1.25

Naval Civil Engineering Lab., Port Hueneme, Calif.

HYDRODYNAMIC ANALYSIS OF A SPREAD-MOORED PLATFORM IN THE OPEN SEA.
Technical rept. Jun 63-Jul 65.
by Bruce J. Muga. Aug 66, 218p TR-R-440
Proj. Y-F015-01-03-001

Descriptors: (*Floating bodies, Mooring), (*Hydrodynamics, Floating bodies), Ocean waves, Motion, Barges, Model tests, Equations of motion, Force (Mechanics).

A moored construction-type platform excited by irregular random surface gravity waves was studied in the laboratory, in the field, and theoretically. The platform was spread moored by four 2-1/2-inch die-lock chains in about 165 feet of water in the open Pacific Ocean. Water level variations at three locations, ship rotations and accelerations, mooring forces, and wind velocities were measured in sea states 2 and 3, and a simulated sea state 4 in the laboratory. Three recordings each of the prototype and model tests were analyzed using time series techniques to provide apparent amplitude response operators for all ship motions and mooring forces. The motions of the barge when excited by regular uniform surface gravity waves were predicted using the linear theory of ship motion. The fundamental analytical tool used in the computations is the well-known slender body theory. Agreement between theory, model, and prototype results is considered to be excellent for the surge, sway, roll, heave, and pitch motions. Agreement for the yaw motion is poor. It is concluded that the most probable value of the annual maximum force induced on any of the moorings is 120 kips. The present mooring configuration possesses sufficient reserve strength to preclude failure of the moorings due to wave-induced motions. (Author)

AD-638 789 **Field 13J, 15A**
CFSTI Prices: HC$4.00 MF$0.75
Bureau of Ships, Washington D. C.
THE EYES AND THE EARS OF THE SUBMARINE.
by V. N. Krasnov. Aug 66, 111p Trans-988
TT-66-62202
Trans. of mono. Glazi i Ushi Podvodnoi Lodki, Moscow, 1961.

Descriptors: (*Submarines, State-of-the-art reviews), Underwater navigation, Undersea warfare, USSR.

The book contains an examination of the basic technical means which a modern submarine uses to carry out her observations -- periscope, radiolocation, hydro-acoustics and television, their organization and use in battle. The book is destined for broad readership. (Author)

AD-638 807 **Field 13J**
CFSTI Prices: HC$3.00 MF$0.50
Southwest Research Inst., San Antonio, Tex.
A STUDY OF THE FEASIBILITY OF DISSIMILAR MATERIAL MODELING TECHNIQUES AS APPLIED TO THE RESPONSE OF SHIP STRUCTURES TO WATER IMPACT.
Final summary rept.
by John F. Dalzell, and Peter S. Westine. Jul 66, 54p
Contract N600 (167)64136 (X)
Proj. SwR1-02-1767

Descriptors: (*Ship models, Materials), Feasibility studies, Hydrodynamics, Impact tests.

The report summarizes a study of the feasibility of producing model structural materials suitable for structural response modeling where Froude scaling is required for hydrodynamic reasons. It was not possible to achieve general techniques of developing model materials suitable for elastic-plastic modeling of arbitrary prototype materials to arbitrary scale ratios. However, it was possible to see that elastic-plastic modeling may be feasible for higher strength steels at approximately 1/10 or 1/40 geometric scale ratios. Additional development work would be required. (Author)

AD-639 053 **Field 13J, 14B**
CFSTI Prices: HC$2.00 MF$0.50
Ship Structure Committee, Washington, D. C.
GUIDE FOR INTERPRETATION OF NON-DESTRUCTIVE TESTS OF WELDS IN SHIP HULL STRUCTURES.
Sep 66, 26p SSC-177
Contract Nobs-90310

Descriptors: (*Non-destructive testing, *Welds), (*Ship hulls, Welds), Radiography.

A survey was made of various Codes and Standards applicable to the interpretation of radiographs of welds and the Guide has been developed for application to welds in ship hull structures of the general cargo, tanker and passenger class as differentiated from naval ships. The Guide exhibits typical X-ray and other non-destructive test results of several classes of defects with suitable text to delineate the maximum size and/or distribution that would be recommended as acceptable for ship hulls. (Author)

AD-639 093 **Field 13J**
CFSTI Prices: HC$1.00 MF$0.50
Davidson Lab., Stevens Inst. of Tech., Hoboken, N. J.
COMPARATIVE TESTS ON MODEL 2387 WITH AND WITHOUT BOTTOM CAMBER IN SMOOTH AND ROUGH WATER.
Letter rept.
by Gerard Fridsma. Jun 66, 24p LR-1153
Contract N600 (167)61303 (x)
Proj. DL-3147/241

Descriptors: (*Patrol craft, Model tests), Camber, Hydrodynamics.

Performance characteristics in smooth and rough water are presented for a 52 ft., 55,000 lb. displacement, hard chine patrol boat, with and without bottom camber; based on tests conducted on a 1/16-scale model (2387). (Author)

AD-639 162 **Field 13J**
CFSTI Prices: HC$4.00 MF$1.00
David Taylor Model Basin, Washington, D. C.
A SURVEY OF ANALYTICAL TECHNIQUES FOR DETERMINING THE STATIC AND DYNAMIC STRENGTH OF PRESSURE-HULL SHELL STRUCTURES.
Final rept.
by Nicholas L. Basdekas. Sep 66, 129p Rept. no. 2208
Proj. SR-011-0101
Task 0401

Descriptors: (*Hulls (Marine), Mechanical properties), (*Structural shells, Cylindrical bodies), Pressure vessels, Structures, Bibliographies, Analysis, Statics, Dynamics.

A survey is made of the analytical and empirical procedures presently in use and proposed for the determination of the static and dynamic strengths of pressure-hull shell structures. The credibility and range of validity of these procedures are established, wherever possible. Problem areas requiring additional R and D effort are identified. (Author)

AD-639 171 **Field 13J**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
SURVEY OF THE LIGHTING INSTALLATION IN THE U.S.S. TUSK (SS-426).
Memo rept.
by Ira Schwartz, and S. M. Luria. 2 Jun 59, 5p
MR-59-3
NAVMED-NM-22-02-20.01.05

Descriptors: (*Submarines, *Lighting equipment), Illumination, Specifications.

Identifiers: SS 426.

AD-639 174 **Field 13J**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
RED LIGHTING SURVEY ABOAD THE USS RANDOLPH (CVS-15).
Memo. rept.
by Forrest L. Dimmick. 6 Apr 60, 4p MR-60-6
NAVMED-MR005.14-1100.01.07

Descriptors: (*Aircraft carriers, Illumination), (*Lighting equipment, Aircraft carriers), Colors, Effectiveness, Vision, Adaptation (Physiology), Navigation, Performance (Human), Visual acuity.

A survey of the red lighting installations aboard the USS RANDOLPH was conducted to determine the functions of red illumination and the efficiency of the illumination to carry out the desired functions. There are two kinds of night operations for which red lighting is required: (a) aircraft handling and flying, and (b) navigation of the ship. In both operations, the functions of red light are to expedite dark adaptation and to protect it against deterioration by white light.

AD-639 176 **Field 13J**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
MINIMAL RED LIGHT LEVELS ON BOARD SUBMARINES.
Memo rept.
by Forrest L. Dimmick. 14 Jan 60, 8p MR-60-2
NAVMED-MR005.14-1100.06

Descriptors: (*Submarines, *Lighting equipment), (*Submarine personnel, Visual acuity), Adaptation (Physiology), Vision, Colors, Brightness.

Specific limiting brightness values were determined for light sources and working surfaces for submarine compartments where red lighting is required, in order to provide adequate seeing conditions under red light with minimum interference to dark-adapted personnel. Since acuity decreases as the level of illumination is lowered, whereas dark adaptation increases, any specifications of brightness levels can be no more than a workable compromise between the two requirements. Accordingly, initial adaptation should be made under the best possible conditions, that is under the lowest feasible red illumination wherein the men can perform necessary tasks.

AD-639 178 **Field 13J**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
LIGHTING SURVEY OF U.S.S. ANGLER (SS240).
Memo rept.
by Jo Ann S. Kinney, and Mary M. Connors. 23 Apr 63, 7p MR-63-5
NAVMED-MR005.14-1100-1.11

Descriptors: (*Submarines, *Lighting equipment), Illumination, Specifications.

Identifiers: SS 240.

The lighting aboard the U.S.S. ANGLER (SS 240) was surveyed to determine the adequacy of existing illumination. The findings of the survey indicate that in general, the light levels aboard meet suggested standards. Specific recommendations are made for improvement.

AD-639 244 **Field 13J, 13A**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
LIGHTING SURVEY OF U.S.S. TRINGA (ASR-16).

Memo rept.
by J. A. S. Kinney, and S. M. Luria. 1 Mar 63, 4p MR-63-1
NAVMED-MR005.14-1100-1.09

Descriptors: (*Naval vessels (Support), Illumination), (*Lighting equipment, Naval vessels (Support)), Intensity, Effectiveness, Standards, Safety.

Identifiers: ASR-16.

The general findings of the lighting survey indicate that the lighting is outdated, inefficient, and substandard. The illumination on the desks in the officers' staterooms is generally about half of the normal specified levels. The illumination in the crews berths is grossly inadequeate; it was about one-tenth of the adequate reading level. Light level throughout the vessel should be brought up to suggested minima Ref. 1,2. The light level should be 20 footcandles minimum on desks and other work areas. Light level for reading in berths should be 10 ft-c or minimum. The replacement of present fluorescent fixtures with larger fixtures is recommended in the ward room and the crews' mess room. New reading lights should be installed in all berths with priority given to the replacement of the old type found in crews' quarters. In the officers' staterooms, incandescent fixtures should be replaced by fluorescent fixtures.

AD-639 245 **Field 13J, 13A**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
LIGHTING SURVEY ON U.S.S. IREX (SS482).
Memo rept.
by S. M. Luria. 1 Mar 63, 4p MR-63-2
NAVMED-MR005.14-1100-1.10

Descriptors: (*Submarines, Illumination), (*Lighting equipment, Submarines), Intensity, Effectiveness, Standards, Safety.

Identifiers: SS428.

Most of the lighting is by incandescent bulbs, often unshielded so as to give more light. The general level of illumination in work areas was found to be very low, generally much below acceptable levels. Lighting levels should be brought up to around 20 foot-candles. The replacement of incandescent bulbs by fluorescent fixtures would be desirable. Additional fixtures are needed in several locations, such as the radio room, the sick-bay area, the conning tower and over the torpedoes.

AD-639 489 **Field 13J, 10C**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
REPLACEMENT OF LEAD ACID STORAGE BATTERIES WITH ALKALINE ONES ON 'ROCKET' TYPE SHIPS.
by N. Andreev, and V. Nalebin. 7 Jun 66, 9p
FTD-TT-65-1879
TT-66-62351
Unedited rough draft trans. of Rechnoi Transport (USSR) n7 p42-3 1964.

Descriptors: (*Ships, Batteries + components), (*Storage batteries, Ships), (*Alkaline cells, Ships), Hydrofoil boats, Electrical equipment, USSR.

Modification of the electrical system of the 'Rocket' ('Raketa') class hydrofoil boats to accept alkaline cells in place of lead-acid storage batteries is described.

PB-170 864 **Field 13J**
CFSTI Prices: HC$8.60 MF$0.75
Michigan Univ., Ann Arbor. Dept. of Naval Architecture and Marine Engineering.
COLLISION PROTECTION OF NUCLEAR SHIPS.
by Odo Krappinger. May 66, 82p
Contract MA-2564
Proj. ORA-07990
A Survey of the State of the Art. Prepared in cooperation with Dept. of Commerce, Washington, D. C. Maritime Admin.

Descriptors: (*Nuclear powered vessels, Safety), Impact tests, Damage, State-of-the-art reviews, Marine engineering, Nuclear power plants, Ship structural components, Design, Impact shock, Shielding.

A survey of the literature shows that since the design of N. S. SAVANNAH the progress of research made in the field of collision protection of nuclear power plants has been only modest. This study tries to show how the whole problem of collision protection can be broken down. It also summarizes the state of the art with regard to the individual aspects of the problem.

PB-170 868 **Field 13J**
CFSTI Prices: HC$5.00 MF$1.00
Grumman Aircraft Engineering Corp., Bethpage, N. Y.
OPERATIONAL TESTING AND EVALUATION OF THE HYDROFOIL SEACRAFT DENISON FROM JUNE 1962 THROUGH OCTOBER 1963.
1963, 188p
Contract MA-2619

Descriptors: (*Hydrofoil boats, Performance (Engineering)), Tests, Marine surface propulsion, Stability, Maneuverability, Ship structural components, Dynamics, Maintenance, Marine engines, Marine propellers.

The report summarizes the results of operational testing and evaluation of the HS Denison for the time period between June 1962 (launch date) through October 1963 (completion of smooth and rough water trials). Data are presented to describe vehicle and system operation in both smooth and rough water. Where applicable, experimental data are compared with initial predictions. In addition, modifications resulting from operational experience are described. During the time period reported on herein, the Denison has exceeded its smooth water, 80-ton, design speed of 60 knots; the vehicle has successfully operated in waves up to 7 feet in height, 1200 passengers have been given demonstration rides, and 132-foilborne and 272-hullborne hours of operation have been logged. (Author)

AD-409 097 See Field 11I

AD-639 356 See Field 11D

AD-639 567 See Field 11F

AD-639 582 See Field 6K

AD-639 583 See Field 6K

AD-639 599 See Field 11F

AD-639 619 See Field 13E

PB-170 737 See Field 8J

PB-170 863 See Field 14B

13K. PUMPS, FILTERS, PIPES, FITTINGS, TUBING, AND VALVES

N66-25571 **Field 13K**
CFSTI Prices HC$3.00 MF$0.75
Marquardt Corp., Ogden, Utah.
TWO (2) WAY, LATCHING, DC SOLENOID CONTROL VALVE FINAL REPORT, 1 MAR. - 28 DEC. 1965.
by R. A. Lynch. 3 Jan 66, 73p NASA-CR-65340, S-479
Contract NAS9-4069

Descriptors: Cluster, Control, *Control valve, Current, Dc, Direct, *Direct current (dc), Engine, Hypergolic, *Hypergolic propellant, Latch, Propellant, Reaction, *Reaction control, *Solenoid, Supply, System, Valve.

For abstract, see S 04 14.

N66-34532 **Field 13K**
CFSTI Prices HC$1.00 MF$0.50
Illinois Univ., Urbana.
PUMPING SPEED OF GETTER-ION PUMPS AT LOW PRESSURES.
by A. Dallos, and F. Steinrisser. Jun 66, 18p
NASA-CR-77470, R-302
Grant NSG-376, Contract DA-28-043-AMC-00073/E/

Descriptors: Current, Diode, *Helium, *Hydrogen, Ion, *Ion pump, *Nitrogen, Pressure, Pump, Speed, Triode, Vacuum, Velocity, Very low.

For abstract, see S 04 20.

N66-34790 **Field 13K**
CFSTI Prices HC$1.00 MF$0.50
Titeflex, Springfield, Mass.
DESIGN, DEVELOPMENT, MANUFACTURE AND PREFLIGHT CERTIFICATION TEST OF FLEXIBLE HOSE ASSEMBLIES FINAL REPORT, JUN. 29, 1965 - FEB. 24, 1965.
by J. Hengartner. 1965, 9p NASA-CR-77408
Contract NAS8-11791
Its Rept.-66-ttr-027

Descriptors: Burst, Coil, Core, *Fitting, Flexibility, Flexure, Hose, Inner, Leakage, Pipe, Reinforced, *Teflon, *Tube, Weight, Wire.

For abstract, see S 04 20.

N66-35239 **Field 13K**
CFSTI Prices HC$1.00 MF$0.50
Illinois Univ., Urbana.
PUMPING SPEED OF GETTER-ION PUMPS AT LOW PRESSURES.
by A. Dallos, and F. Steinrisser. Jun 66, 20p
NASA-CR-77480
Grant NSG-376, Contract DA-28-043-AMC-00073/E/

Descriptors: Diode, Factor, *Getter, Helium, Hydrogen, Ion, *Ion pump, Low pressure, Nitrogen, Pressure, Pump, *Pumping, Speed, Time, Triode.

For abstract, see S 04 20.

13L. SAFETY ENGINEERING

AD-639 594 **Field 13L, 15F**
CFSTI Prices: HC$5.00 MF$1.25
HRB-Singer, Inc., State College, Pa.
PRELIMINARY INFRARED FIRE MAPPING SYSTEMS ANALYSIS.
Final rept.
by Eugene C. Mikelonis, Richard P. Shearer, and Gretchen L. Duguay. Nov 65, 200p Rept. no. 75011-F
Contract OCD-PS-65-6

Descriptors: (*Fires, Mapping), (*Nuclear explosions, Fires), Infrared detectors, Airborne, Monitors, Systems engineering, Infrared scanning, Civil defense systems.

An analysis is presented of the factors affecting operational use of a post-attack IR fire mapping system. Organizations that could support such an operation were determined. Based upon the employment of a specific number of IR units, the time to map all areas of interest was calculated. A 'threat indifference' approach was employed to determine the areas of interest. A training program is presented for both system operators and techni-

cal personnel. Many potential peacetime applications of the system were defined. A cost analysis of the various system configurations is also given. (Author)

N66-25447 Field 13L
CFSTI Prices HC$1.00 MF$0.50
Technological Lab. Rvo-tno, Rijswijk (Netherlands).
STABLE 60 TYPE FOAMING FIRE EXTINGUISHER.
Schuimvormend Brandblusmiddel Stabiel 60
by E. W. Lindeijer. 15 Feb 66, 23p TL-1966-6, TDCK-44756
In Dutch

Descriptors: (*Application, Equipment), *Equipment specifications, Extinguisher, Fire, *Fire extinguisher, *Foaming, Method, Military, Precipitation, Sediment, Specification, Technology, *Test method, Testing.

For abstract, see S 04 14.

PB-170 890 Field 13L
CFSTI Prices: HC$2.00 MF$0.50
Federal Fire Council, Washington, D. C.
FEDERAL FIRE COUNCIL, MINUTES OF MEETING DECEMBER 15, 1965: HIGH EXPANSION FOAM FOR FIRE SUPPESSION.
15 Dec 65, 38p

Descriptors: (*Foams, *Fire extinguishers), (*Fire extinguisher, Foams), Fire safety, Accidents, Reduction, Government employees, United States Government, Symposia.

PB-170 891 Field 13L
CFSTI Prices: HC$1.00 MF$0.50
Federal Fire Council, Washington, D. C.
MISSION SAFETY 70 AND FIRE PROTECTION AND PROTECTIVE SERVICE.
by Francis J. Palme. 17 Jun 66, 16p
Presented at Engineer Officers' Conference, Chicago, Ill., March 23-25, 1966.

Descriptors: (*Fire safety, Government employees), (*Safety, Government employees), Accidents, Reduction, Instruction manuals, United States Government, Symposia.

Mission Safety 70 is a new, practical safety effort designed to reduce Federal work injuries and costs, year by year, until a total 30 percent reduction is achieved by 1970.

PB-173 219 Field 13L, 13B
CFSTI Prices: HC$3.00 MF$0.75
New York State Dept. of Motor Vehicles, Albany. Research Library.
BIBLIOGRAPHY: NEW YORK STATE SAFETY CAR PROJECT.
May 66, 64p

Descriptors: (*Passenger vehicles, Safety), (*Safety devices, Passenger vehicles), Motor vehicle accidents, Crash injuries, Traffic, Bibliographies, Motor vehicle operators, Behavior, New York.

PB-173 232 Field 13L, 13B
CFSTI Prices: HC$3.00 MF$0.75
Highway Research Board, Washington, D. C.
HIGHWAY SAFETY, 1963 AND 1964: NINE REPORTS.
1965, 68p Record-79
Presented at Annual Meeting (43rd) 13-17 Jan 65 and Annual Meeting (44th) 11-15 Jan 65.

Descriptors: (*Motor vehicle accidents, Analysis), (*Roads, Safety), (*Traffic, Safety), Motor vehicle operators, Passenger vehicles, Hazards, Deafness, Personality, Factor analysis.

CONTENTS: Causes and characteristics of single-car accidents; A factor analysis of accident records; Personality and biographical variables in relation to driving item response; The totally deaf driver in California; Program for determination of high-accident locations; Programming hazard-reducing improvements; Teaming up for safe design and operation; Adapting the highway to the human element; A future for highway safety research.

PB-173 155 See Field 13B

PB-173 220 See Field 13F

PB-173 229 See Field 5R

PB-173 230 See Field 5J

13M. STRUCTURAL ENGINEERING

AD-638 819 Field 13M
CFSTI Prices: HC$1.00 MF$0.50
Brooks and Perkins, Inc., Detroit, Mich.
DEVELOPMENT OF A LIGHTWEIGHT 50 FOOT MAST; MAST AB-864 ( )/G.
Quarterly progress rept. no. 3, 24 Dec 65-23 Mar 66.
by Joseph R. Harris. Aug 66, 15p Rept. no. 313
Contract DA-28-043-AMC-01416 (E)
Proj. DA-1E6-34301-D-244
Task 1E634301D24406
ECOM-01416-3
Rept. on Development of a Quick-Erectable, 50-Foot, Portable, Lightweight Mast.

Descriptors: (*Antenna masts, Portable), Weight, Aluminum alloys, Pipes, Installation, Wire, Mechanical drawings.

This mast, being developed to meet the requirements of specification SCL-4296B, is basically a revised and improved version of the earlier AB-864 ( )/G mast developed to meet specification SCL-4296A. The primary objectives of this program are; (1) to reduce the mast weight and overall size, (2) to decrease the erection and repackaging time and (3) assure greater personnel safety. Manufacturing drawings have been prepared on major assemblies and components. (Author)

AD-639 303 Field 13M, 15F
CFSTI Prices: HC$10.30 MF$3.00
Agbabian-Jacobsen Associates, Los Angeles, Calif.
STUDY OF SHOCK ISOLATION FOR HARDENED STRUCTURES.
17 Jun 66, 732p AJA-6424
Contract DA-49-129-eng-532

Descriptors: (*Shock absorbers, Supports), (*Vibration isolators, *Structures), Impact shock, Nuclear explosion damage, Explosion effects, Springs, Personnel, Instrumentation.

The design of shock isolation systems for equipment and personnel platforms within aboveground and underground hardened structures is explained by the use of both the shock spectra and the velocity pulse techniques. Ground motions are explained and their pertinent quantities are defined; the effect of the structure supporting the shock isolation system is considered; and methods are presented to obtain the response of practical isolation systems. Design procedures are outlined with frequent use of numerical examples; and tolerance levels are summarized, so that the calculated responses of designed systems may remain within acceptable limits. The report also gives a descriptive account of almost all the major shock isolation systems that have been installed at various military facilities. (Author)

AD-639 414 Field 13M
Not available from CFSTI.
National Research Council of Canada, Ottawa (Ontario). Div. of Building Research.
BUILDING CODES, TEST METHODS AND INDUSTRIALISED BUILDING.
Technical paper.
by R. F. Legget. Apr 66, 4p TP-214
NRC-8955
Availability: Published in CIB Congress (3rd), Towards Industrialised Building, Copenhagen 1965.

Descriptors: (*Buildings, Standards), Test methods, Canada.

AD-639 507 Field 13M
Not available from CFSTI.
Technion-Israel Inst. of Tech., Haifa.
BUCKLING OF CLAMPED CONICAL SHELLS UNDER EXTERNAL PRESSURE.
Revised ed.
by Josef Singer. 14 Oct 65, 12p
Grant AF-EOAR-58-63, Contract DA-44-177-AMC-115 (T)
Proj. AF-9782
Task 978201
AFOSR-66-1364
Revision of manuscript submitted 27 Apr 65.
Availability: Published in AIAA Journal v4 n2 p328-37 Feb 1966.

Descriptors: (*Structural shells, Buckling (Mechanics)), Conical bodies, Israel, Differential equations, Boundary value problems, Numerical analysis, Structural properties.

A method of analysis of the buckling of clamped conical shells under external pressure is presented. The method is based on solution of modified Donnel-type stability equations in the presence of slightly relaxed boundary conditions for the u and v displacements. It is then shown that the elastic restraints implied by the proposed solution closely approximate the boundary conditions of the perfectly clamped shell u v O. Numerical results covering a wide range of geometries are obtained for uniform hydrostatic pressure loading and are compared with those for corresponding simply supported shells. Correlation with equivalent cylindrical shells then yields a simple approximate analysis. (Author)

N66-24888 Field 13M
CFSTI Prices HC$1.00 MF$0.50
Royal Netherlands Aircraft Factories Fokker, Amsterdam.
RESULTS OF FATIGUE TESTS ON LUGS WITH REFERENCE TO THE STANDARD CURVES DERIVED BY HEYWOOD AND LARSSON.
by A. A. Jongebreur. 27 Sep 65, 11p SM-37

Descriptors: Alternating, Calculation, Curve, Fatigue, *Fatigue test, Graph, *Lug, Standard, *Stress, Test.

For abstract, see S 04 13.

N66-25287 Field 13M
CFSTI Prices HC$1.00 MF$0.50
Tokyo Univ. (Japan).
AN INVESTIGATION OF CREEP BENDING CHARACTERISTICS OF LINEAR POLYMER COLUMN INFLUENCED BY NON-UNIFORM THERMAL ENVIRONMENTS.
by A. Kobayashi. Feb 66, 21p SAS-401, VOL. 31, NO. 2

Descriptors: Buckling, Characteristics, *Column, Creep, *Creep buckling, Dependence, Effect, Environment, Galerkin method, Linear, Maxwell equation, Nonuniform, *Polymer, Relation, Strain, Stress, *Stress-strain time relation, Temperature, *Temperature effect, Tensile, Thermal, Time, Viscosity, Voigt effect.

For abstract, see S 04 13.

N66-25809 Field 13M
CFSTI Prices HC$2.00 MF$0.50
Chalmers Univ. Of Technology, Goteborg (Sweden).

NEW FACETS OF RESEARCH ON KAM STEEL BARS.
Nya Ron Betraffande Anvandningen Av Kamjarn
by H. Granholm. 1965, 40p
In Swedish, English Summary Its Trans. No. 305

Descriptors: Bar, Beam, Bond, *Concrete, Crack, *Deformation, Formation, Material, Reinforced, *Reinforced material, Reinforcement, *Steel, Stress, Tensile.

For abstract, see S 04 14.

N66-25810 Field 13M
CFSTI Prices HC$2.00 MF$0.50
Royal Military Coll. Of Canada, Kingston (Ontario).
ULTIMATE CAPACITY OF STEEL COLUMNS LOADED BIAXIALLY.
11 Mar 66, 48p

Descriptors: Axial, *Axial compression, Biaxis, Capacity, Column, Compression, *Compression loading, Hollow, Loading, Prediction, Square, *Steel, Strength, *Tubing, Ultimate, Yield, *Yield strength.

For abstract, see S 04 14.

AD-409 097 See Field 11I

AD-639 448 See Field 20K

AD-639 486 See Field 20K

AD-639 559 See Field 17B

AD-639 570 See Field 5A

PB-173 252 See Field 15E

14B. LABORATORIES, TEST FACILITIES, AND TEST EQUIPMENT

AD-457 268 Field 14B
CFSTI Price: HC$1.00
Royal Aircraft Establishment, Farnborough (England).
A MINIATURE SPIRAL BOURDON TUBE PRESSURE TRANSDUCER.
by E. F. Price. Oct 64, 18p Technical rept. TR-64019

Descriptors: (*Transducers, Helixes), Pressure, Stainless steel, Potentiometers, Stability, Theory, Tests, Impact shock, Acceleration, Vibration, Temperature.

This report gives information on the design of a miniature pressure transducer employing a spiral shaped stainless steel Bourdon tube and a deposited track potentiometer. The test results obtained from several models covering different pressure ranges are shown together with an analysis of their performance under different environmental conditions. The report also discusses the problems likely to be encountered in the design of very low pressure models and suggests a possible line of approach to further development, with particular reference to transducers having a pressure range below about 0/20 lb sq. in. (Author)

AD-638 872 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
DEVICE FOR MULTIPLE-POINT MEASUREMENT OF TEMPERATURE.
by S. P. Mazur. 28 Jun 66, 6p FTD-TT-65-1937
Unedited rough draft trans. of Patent (USSR) 168 497, appl. 868924/26-10, 4 Dec 63.

Descriptors: (*Temperature, Measurement), Patents, USSR, Multiple operation, Thermocouples, Potentiometers, Electric switches, Junction boxes.

The object of the invention is a device for multiple-point measurement of temperature with the aid of a thermocouple included in the circuit of a potentiometer with a change-FTD-TT-65-1937/1+2+4 over switch. Thermocouples are connected to a potentiometer through a junction box in accordance with the scheme: thermocouple - junction box - change-over switch of the potentiometer - slip rings of the change-over switch-junction box - terminal of the potentiometer, while the compensation wire is extended only on the first and last sections.

AD-638 880 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
DEVICE FOR MEASURING TEMPERATURE.
by B. A. Pashkovskii, and M. B. Fridzon. 28 Jun 66, 5p FTD-TT-65-1938
Unedited rough draft trans. of Patent (USSR) 168 499, appl. 796794/26-10, 1 Oct 62.

Descriptors: (*Temperature, Measurement), Patents, USSR, Generators, Oscillators, Circuits, Oscillation, Feedback.

The object of the invention is a device for measuring temperature which contains a generator of high-frequency oscillations and an oscillating circuit consisting of an induction coil and a capacitor and used as a pickup of temperature. For the purpose of automation and continuity of measurements the oscillating circuit is introduced into the feedback circuit of the generator.

AD-638 919 Field 14B, 4A, 17E, 22B K
CFSTI Prices: HC$8.75 MF$3.50
Michigan Univ., Ann Arbor. Inst. of Science and Technology.
PROCEEDINGS OF THE FOURTH SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT; 12, 13, 14 APRIL 1966.
Jun 66, 875p Rept. no. 4864-11-X
Contract Nonr-1224 (44)
Available in black/white only after original supply is exhausted. See also AD-614 032.

Descriptors: (*Remote control systems, *Monitors), (*Symposia, Monitors), (*Soace probes, Instrumentation), (*Atmospheric sounding, Instrumentation), Data, Microwaves, Radar, Seismology, Geology, Geography, Oceanology, Data processing systems, Detection, Mapping, Infrared scanning, Detectors.

Identifiers: Sensors (Instrumentation).

The symposium was conducted as part of a continuing program investigating the field of remote sensing, its potential in scientific research and engineering practices, and some of the factors important in the growth of the field. The purpose of this symposium was to stimulate an exchange of information on all aspects of remote sensing, with special emphasis on such topics as needs for remotely sensed data, data management, and the special educational needs of people working in this field. In addition to special sessions and panels treating these subjects, 50 papers, dealing with any current remote sensing programs, data acquisition, data analysis and application, and equipment design, were presented. (Author)

AD-638 970 Field 14B, 13H
CFSTI Prices: HC$1.00 MF$0.50
CTS Corp., Elkhart, Ind. Research and Development Div.
PRODUCTION ENGINEERING MEASURE FOR SUBMINIATURE, TRANSISTOR TYPE POTENTIOMETERS.
Quarterly progress rept. no. 20, 1 Apr-30 Jun 66.
by C. L. Holmes, and D. C. Kinsey. 30Run 66, 12p
Contract DA-36-039-SC-85976E
See also AD-634 975.

Descriptors: (*Potentiometers, Manufacturing methods), (*Subminiature electronic equipment, Potentiometers), Transistors, Reliability (Electronics), Life expectancy.

AD-638 971 Field 14B, 5A
CFSTI Prices: HC$1.00 MF$0.50
Materials Advisory Board, NAS-NRC, Washington, D. C.
MATERIALS EVALUATION TECHNIQUES.
Aug 66, 25p MAB-225-M
Contract DA-49-083-OSA-3131

Descriptors: (*Materials, Performance (Engineering)), Test methods, Data, Construction, Structural parts.

Guidelines for materials evaluation are not now available. The need for a Materials Advisory Board study of the subject was considered and endorsed. The proposed study would identify systems, components, environments, design criteria, and relate these factors to test techniques and trade-off approaches. This could permit guidelines to be drawn on recommended approaches to materials evaluation, trade-off studies, development of test techniques, and detail design data generation. The materials evaluation considerations will cover all structural materials except composites and the classically brittle materials. (Author)

AD-638 973 Field 14B, 20E, 7D
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
JOURNAL OF APPLIED SPECTROSCOPY, 1965, VOL. 3, NO. 3: SELECTED ARTICLES.
by V. L. Broube, V. V. Zaika, and T. A. Soovik.
23 Aug 66, 20p FTD-HT-66-310
TT-66-62244
Unedited rough draft trans. of Zhurnal Prikladnoi Spektroskopii (USSR), v3 n3 p225-9, 279-82 1965.

Descriptors: (*Lasers, Ruby), (*Phosphorescent materials, Halides), Scintillation, Alkali metal compounds, Crystals, Luminescence, Mirrors, Operation, Performance (Engineering), USSR.

Contents: Operation of a ruby laser with inclined mirrors, The mechanism of radioluminescence of alkali-halide phosphor crystals.

AD-638 977 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
AMPLITUDE-PHASE MEASURING DEVICE WITHOUT PHASE SENSITIVE DETECTORS.
by Yu. B. Shaub. 31 Aug 66, 12p FTD-TT-66-9
TT-66-62248
Unedited rough draft trans. of Geofizicheskoe Priborostroenie (USSR), n16 p38-45 1963.

Descriptors: (*Phase meters, Design), Phase measurement, USSR.

AD-639 065 Field 14B
Not available from CFSTI.
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
DIRECT DETERMINATION OF THE TRANSFER FUNCTION OF AN INFRARED SPECTROMETER.
Physical sciences research papers.
by Hajime Sakai, and George A. Vanasse. 6 Oct 65, 10p AFCRL-PSRP-245, AFCRL-66-448
Proj. AF-7670
Task 767003
Availability: Published in Journal of the Optical Society of America v56 n3 p357-62 Mar 1966.

Descriptors: (*Functions, Spectrum analyzers), (*Spectrum analyzers, Infrared spectros-

copy), Determination, Interferometers, Integral transforms.

The transfer functions of infrared spectrometers for incoherent illumination are determined using a lamellar grating interferometer. The spectrometer is illuminated with incoherent radiation and the spectral distribution S (v-v sub 0) of its output radiation is studied with the interferometer. The interferometer output F (sigma) is the Fourier transform of S (v-v sub 0), and the envelope of F (sigma) yields directly the transfer function of the spectrometer. This technique is used rather than the usual one of using a narrow spectral line because no such lines from thermal sources are available in the far-infrared. Laser radiation is unsuitable because it would yield the transfer function of a spectrometer in coherent radiation and this function is of no use for the majority of experiments where the spectrometer is incoherently illuminated. Experimental measurements show a good agreement with theoretically predicted results. (Author)

AD-639 160 **Field 14B, 11F**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
ON THE METHOD OF TESTING METALS AT HIGH TEMPERATURE AND PRESSURE VALUES.
by M. L. Gorb. 13 Jun 66, 12p FTD-TT-65-1887 TT-66-62286
Unedited rough draft trans. of Prykladna Mekhanika (USSR) v10 n6 p547-51 1964.

Descriptors: (*Pressure vessels, Test equipment), (*Metals, Test methods), USSR, High-pressure research, Temperature, Measurement, High-temperature research, Thermocouples.

The construction is described of a new variant of conical cylindrical high pressure chamber. A method is proposed for measuring temperatures in the high pressure chamber, based on the principle of a natural thermocouple. (Author)

AD-639 172 **Field 14B, 6P**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
MULTIPLE CHECKERBOARD ACUITY TESTER.
Memo. rept.
by Forrest L. Dimmick. 19 Jan 60, 9p MR-60-3
NAVMED-MR005.14-2001.03.03

Descriptors: (*Test equipment, Visual acuity), (*Visual acuity, Tests), Submarine personnel.

A visual acuity test was designed utilizing checkerboard type targets, and presenting several targets simultaneously. A multiple checkerboard acuity tester was developed for use in screening large groups of submarine candidates.

AD-639 286 **Field 14B, 5J**
CFSTI Prices: HC$6.60 MF$0.75
Johns Hopkins Univ., Baltimore, Md.
A LINEAR MOTION CHARACTERISTICS RECORDER.
Memo. rept.
by R. J. Jeffries, and Ferdinand Hamburger Jr.
1956, 65p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-36

Descriptors: (*Motion, Psychometrics), Performance (Human), Test equipment, Circuits, Synchros, Recording systems.

The recorder was designed to produce permanent records of the parameters of motion encountered in the study of basic psychological motor problems. The equipment provides a freely-moving stylus which may be directed by a psychological subject over a predetermined traverse. Simultaneous time-history records are produced of instantaneous displacement, velocity, and angular deviations of the stylus from the traverse. The paper reviews the engineering considerations involved in the selection and design of the signal-pickups and associated equipment. Engineering analyses and performance data are included. Of particular engineering interest are the theoretical analyses and experimental verification of an original velocity-pickup circuit employing a variable resistance element, and an amplification system based on the carrier principle, and making use of a pentagrid-converter 'modulator', for amplifying d-c signals. Also described is a novel circuit application of a standard commercial synchro as an angular pickup which results in simplified circuitry and improved sensitivity, response time, and reduced inertia. (Author)

AD-639 298 **Field 14B, 22B**
CFSTI Prices: HC$2.00 MF$0.50
Heliodyne Corp., Los Angeles, Calif.
PROGRESS ON SAPAG FACILITY, III.
Research note.
by Roy S. Hickman, Horace A. Ory, and I. R. Tannenbaum. Jun 64, 38p RN-15
Contract DA-04-495-Ord-3574 (Z), ARPA Order-360-62

Descriptors: (*Test facilities, *Reentry vehicles), Particles, Acceleration, Shock (Mechanics), Shock tubes, Ablation, Aerosols, Powders, Spectroscopy, Injection.

Identifiers: SAPAG facility, DEFENDER project.

Heliodyne Corporation is investigating the ionization and radiation properties of reentry vehicle materials under conditions which simulate those of actual flight. The experimental program involves the preparation of representative materials into sub-micron sized particles under carefully controlled conditions, the injection of these particles into a shock tube, and the measurement of electron density and radiation as a function of distance behind the shock. From the results obtained, the chemical kinetics of the ablation process and the phenomenology of reentry observables can be elucidated. For this reporting period, refinements in apparatus and techniques for the production of ultra-fine particles, particularly of organic ablators, are described. Representative photomicrographs of powder preparations, as well as number density distribution curves, are presented and discussed. The results of light scattering investigations of aerosol distribution and stability are analyzed. Further modifications to the facility, based in part on the results of the above studies, and further development of instrumentation, are also included. (Author)

AD-639 328 **Field 14B**
CFSTI Prices: HC$2.00 MF$0.50
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
A MICROWAVE CORRELATION RADIOMETER.
Instrumentation papers.
by William B. Goggins Jr. Aug 66, 32p AFCRL-66-534, AFCRL-IP-108
Proj. AF-4600
Task 460010

Descriptors: (*Radiometers, Microwave equipment), Feedback, Correlation techniques, Microwaves.

A practical microwave correlation radiometer was built and tested. Feedback was used to ensure stability and make it unnecessary to match receiver channels. The rms temperature deviation was derived and found to be square root of 2 times that of a total power radiometer. Two separate systems to provide an ac multiplier output were built and evaluated. In one, the receiver channels were tuned to a slightly different frequency while in the other, phase reversal in one channel at an ac rate provided the modulation. The latter method proved easier to instrument. (Author)

AD-639 370 - **Field 14B, 6P**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
A PROJECTION TIMER FOR VISUAL RESEARCH.
Memorandum rept.
by C. E. Woollen, and F. Hamburger Jr. 10 Nov 46, 12p
Contract N5-ori-166 (1)
SPECDEVCEN-166-1-4

Descriptors: (*Timing devices, Optical images), Photographic projectors, Vision, Viewing screens, Display systems.

A device is described for providing visual images for research dealing with visual display methods. The apparatus will produce images variable in diameter from three inches to five feet, with exposure times adjustable from 0.15 to 0.8 seconds with build-up and decay time not exceeding four milliseconds. (Author)

AD-639 379 **Field 14B, 5J**
Not available from CFSTI.
Johns Hopkins Univ., Baltimore, Md.
APPARATUS. AN ELECTRONIC CHRONOGRAPH FOR MEASUREMENT OF VOICE REACTION-TIME.
by R. G. Roush, and Ferdinand Hamburger Jr. 1947, 5p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-27
Availability: Published in The American Journal of Psychology v60 n4 p624-8 Oct 1947.

Descriptors: (*Verbal behavior, *Chronographs), (*Reaction (Psychology), *Time-interval counters), Reflexes, Electronic equipment.

AD-639 423 **Field 14B, 7D, 20I, 20D**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
IMPULSE MASS SPECTROMETER FOR STUDYING HIGH-VELOCITY PHENOMENA IN LOW-PRESSURE GASES AND NONSTATIONARY PLASMA.
by V. A. Simonov, and A. G. Mileshkin. 15 Jun 66, 19p FTD-TT-65-859 TT-66-62336
Edited trans. of Ceskoslovensky Casopis pro Fyziku v12 n5-6 p653-65 1962.

Descriptors: (*Mass spectroscopy, *Spectrum analyzers), Velocity, Plasma medium, Gases, Low-pressure research, Ions, USSR.

Impulse spectrometry methods effectively facilitate the study of high-velocity phenomena in various fields of scientific research - in electronics, plasma physics, chemical kinetics, and vacuum technology. Equipment was developed which permits analysis of phenomena in neutral gas as well as in plasma over a wide range of pressures, plasma concentration, and life spans of the effects studied. (Author)

NBS-MP-275 **Field 14B, 5D**
CFSTI Prices: HC$5.25 MF$3.00
National Bureau of Standards, Washington, D.C.
MEASURES FOR PROGRESS. A HISTORY OF THE NATIONAL BUREAU OF STANDARDS.
by Rexmond C. Cochrane. 1966, 731p
Available from Superintendent of Documents, GPO, Washington, D. C. 20402, HC$5.25 as C 13.10:275.

Descriptors: (*Scientific organizations, History), (*United States Government, Standards), (*Standardization, Scientific organizations)

Laboratories, Scientific personnel, Scientific research, Measurement.

Identifiers: National Bureau of Standards.

NBS-PUB-279 Field 14B, 5A
CFSTI Prices: HC$0.65 MF$1.25
National Bureau of Standards, Washington, D. C.
1965 TECHNICAL HIGHLIGHTS OF THE NATIONAL BUREAU OF STANDARDS.
Annual rept., Fiscal Year 1965.
May 66, 205p
Availability: Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.65 as C13.10:279.

Descriptors: (*United States Government, Scientific research), Reviews, Standards, Materials, Radio transmission.

Identifiers: National Bureau of Standards.

Contents: The director's statement; Institute for Basic Standards; (Physical quantities, constants, and calibration services; Phyical properties; Applied mathematics; Performance characteristics; Technical assistance to others); Institute for Materials Research (Preparation and characteristics of materials, Preparation. Characterization. Measurements of properties of materials, Standard reference materials, Technical assistance to others, Technical information dissemination); Institute for Applied Technology (Engineering measurement and standards, Performance criteria, Linking engineering measurements and performance criteria to standards, Dissemination of technical information, Invention and innovation, Textile and apparel technology, Assistance to other agencies); Central Radio Propagation Laboratory (Immediate objectives; Developments in fiscal 1965); Appendixes (Organization of the National Bureau of Standards; Summary of NBS staff as of June 30, 1965; Financial data for fiscal 1965; Advisory committees; Awards and honors; Education, training, and university liaison; Publications; Patents; The General Conference on Weights and Measures).

NBS-TN-341 Field 14B
CFSTI Prices: HC$0.25 MF$0.50
National Bureau of Standards, Boulder, Colo. Radio Standards Lab.
THE LONG-TERM PERFORMANCE OF TWO RUBIDIUM VAPOR FREQUENCY STANDARDS.
Technical note.
by B. E. Blair, and A. H. Morgan. 22 Jun 66, 36p
Also available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.25.

Descriptors: (*Rubidium, Atomic clocks), (*Atomic clocks, Standards), Molecular beams, Frequency, Vapors, Calibration, Reliability.

Since mid-1961 the National Bureau of Standards has used two rubidium vapor frequency standards as transfer or Working Frequency Standards (WFS). The WFS provides a continuously available frequency which is periodically calibrated in terms of the United States Frequency Standard (USFS). This paper evaluates these calibration data over a 44.5-month period of time. It gives the long-term performance of the rubidium standards in terms of the USFS, compares them with a commercial cesium-beam frequency standard, and presents their reliability characteristics as shown by the mean-time-between-failures (MTBF). The calibration data are graphed with applicable tolerance limits for the between-adjustment periods. The average standard error of estimate about least squares lines fitted to the frequency data is about 2 parts in 10 to the 11th power. The rubidium standards also show a rather consistent daily aging rate of parts in 10 to the 13th power. This would indicate that the frequency of either unit would change a few parts in 10 to the 10th power if operated continuously for one year without any frequency adjustments. (Author)

N66-23950 Field 14B
CFSTI Prices HC$2.00 MF$0.50
Norwegian Defence Research Establishment, Kjeller.
DIGITAL SIMULATION OF A DIGITAL SPECTRUM ANALYZER.
by J. Johnsen. Oct 65, 43p U-180, AD-629387

Descriptors: *Analyzer, Band, Computer, Detector, Digital, *Digital simulation, Electromagnetic, Filter, Law, Narrow, Power, *Power spectrum, Simulation, Spectrum, Square, Wave.

For abstract, see S 04 13.

N66-24315 Field 14B
CFSTI Prices HC$2.00 MF$0.50
European Atomic Energy Community, Brussels (Belgium).
DESIGN CONSIDERATIONS AND CALCULATIONS FOR A LI6 SEMICONDUCTOR SANDWICH FAST NEUTRON SPECTROMETER EXPERIMENT.
by R. A. Rydin. 1966, 30p EUR-2712.E

Descriptors: Background, Calculation, Diode, Fast, *Fast neutron, Fission, *Fission product, Isotope, Lithium, *Lithium 6, Neutron, *Neutron spectrometry, Product, Radioactivity, Reaction, *Semiconductor, Silicon, Spectrometer, Spectrometry, Spectrum, Thermal, *Thermal neutron.

For abstract, see S 04 13.

N66-24414 Field 14B, 9A
CFSTI Prices HC$1.00 MF$0.50
Polish Academy Of Sciences, Warsaw.
APPARATUS FOR INTERNAL FRICTION AND YOUNG'S MODULI MEASUREMENTS IN KILOCYCLE RANGE.
by W. Malinowski. May 65, 23p REPT.-632/X1V/PS

Descriptors: Amplitude, Circuit, Electronic, Equipment, Friction, Internal, *Internal friction, Method, *Quartz, Range, *Resonator, Stability, Strain, Temperature, *Youngs modulus.

For abstract, see S 04 13.

N66-24498 Field 14B
CFSTI Prices HC$1.00 MF$0.50
College Of William And Mary, Williamsburg, Va.
APPARATUS FOR RECORDING OSCILLATION PROPERTIES OF A PENNING IONIZATION GAUGE AT VERY HIGH FREQUENCIES.
by M. D. Holt, and D. B. Raiford. Jun 65, 15p
NASA-CR-74564
Grant NSG-106
Its Tech. Rept.-4

Descriptors: Apparatus, Current, Description, Discharge, Frequency, Gas, Gauge, High frequency, Ionization, *Ionization gauge, Oscillation, *Oscillation frequency, *Penning gauge, Pressure, Property, *Recording instrument, Spectrum, *Very high frequency.

For abstract, see S 04 13.

N66-24511 Field 14B
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SPACE MOLECULAR SINK SIMULATOR FACILITY DESIGN.
by J. B. Stephens. 15 Mar 66, 19p NASA-CR-74654, JPL-TR-32-901
Contract NAS7-100

Descriptors: Backstreaming, Chamber, Cryopumping, Decontamination, Facility, Flux, Research, *Research facility, Simulation, Space, *Space simulation, Sublimation, Titanium, Vacuum, *Vacuum chamber.

For abstract, see S 04 13.

N66-24575 Field 14B
CFSTI Prices HC$4.00 MF$0.75
Aeronautical Research Inst. Of Sweden, Stockholm.
THE FFA AERODYNAMIC RESEARCH AND TEST FACILITIES.
1964, 106p FFA-MEMO-33

Descriptors: Aerodynamics, Aeronautics, Data, Equipment, Facility, Gun, Hypersonic, *Hypersonic wind tunnel, Instrumentation, Low speed, *Low speed wind tunnel, Processing, Research, *Research facility, Sweden, Test, *Test facility, Transonic, *Transonic wind tunnel, Tunnel, Wind.

For abstract, see S 04 13.

N66-24696 Field 14B
CFSTI Prices HC$3.00 MF$0.75
Consolidated Controls Corp., Bethel, Conn.
PRESSURE MEASURING SYSTEMS FOR CLOSED CYCLE LIQUID METAL FACILITIES EIGHTH QUARTERLY REPORT, 1 DEC. 1965 - 28 FEB. 1966.
by A. J. Cassano. 8 Apr 66, 65p NASA-CR-54960, CCC-546
Contract NAS3-4170

Descriptors: Design, Development, Diode, Liquid, *Liquid metal, Metal, Power, Pressure, *Pressure transducer, Product, Rankine cycle, *Sensor, Space, Supply, Thermionic, *Thermionic diode, Transducer.

For abstract, see S 04 13.

N66-24918 Field 14B
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
DETERMINATION OF THE MAXIMAL VALUES OF THE GRAVITATIONAL DRIFT AND THE DRIFT DUE TO IRREGULAR RIGIDITY IN INTEGRATING FLOATED-TYPE GYROSCOPES.
Opredeleniye Maksima'nykh Znacheniy Graviatatsionnogo Dreyfa I Dreyfa Ot Neravnozhestkosti Poplavkovykh Integriruyushchikh Giroskopov
by G. A. Slomyanskiy. May 66, 17p NASA-TT-F-10104
Transl. Into English From Tekhnol. I Konstruirovaniye Giropriborov (Moscow), 1964 P 74-82

Descriptors: Acceleration, Angular, *Drift, Effect, Flotation, Gravitational, *Gravitational effect, Gyroscope, *Gyroscope flotation, Integration, Linear, Moment, Noise, Rigidity, U.s.s.r..

For abstract, see S 04 13.

N66-24919 Field 14B
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
OPERATION OF AN INTEGRATING FLOATED-TYPE GYROSCOPE IN THE CAPACITY OF AN ANGULAR-MOTION NONFOLLOW-UP PICKUP.
O Rabote Poplavkovogo Integriruyushchego Giroskopa V Kachestve Datchika Ugla Povorota Bez Sledyashchego Privoda
by G. A. Slomyanskiy. May 66, 15p NASA-TT-F-10105
Transl. Into English From Tekhnol. I Konstruirovaniye Giropriborov (Moscow), 1964 P 83-90/

Descriptors: Angular, *Angular motion, *Deflection, Drift, Error, Flotation, Gyroscope, *Gyroscope flotation, Instrument, *Instrument error, Integration, Motion, Pickup, Servo, U.s.s.r..

For abstract, see S 04 13.

N66-24954 **Field 14B**
CFSTI Prices HC$3.00 MF$0.50
Western Reserve Univ., Cleveland, Ohio.
FUNDAMENTAL STUDIES ON SEMICONDUCTOR RADIATION DETECTORS SECOND ANNUAL STATUS REPORT, 1 MAR. 1965 - 28 FEB. 1966.
by K. J. Casper. 1966, 53p NASA-CR-74766
Grant NSG-655

Descriptors: Alloy, Channel, Detector, Device, Effect, Electron, Gallium, Lithium, Monoenergetic, Number, Radiation, *Radiation detector, Resolution, Response, Semiconductor, *Semiconductor device, *Silicon, Spectrometer, Temperature, *Temperature effect.

For abstract, see S 04 13.

N66-24997 **Field 14B**
CFSTI Prices HC$1.00 MF$0.50
National Bureau of Standards, Washington, D. C.
THERMOGRAVIMETRIC INSTRUMENT.
by S. Stravs, and L. A. Wall. 1963, 20p NASA-CR-74783
NASA ORDER R-56

Descriptors: *Decomposition, Furnace, Instrument, Isotherm, Nonisothermal, Polymer, Pyrolysis, Pyrometry, Temperature, Thermal, *Thermogravimetry, *Volatility, Volatilization.

For abstract, see S 04 13.

N66-25014 **Field 14B**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SPACE SIMULATOR FACILITIES AT THE JET PROPULSION LABORATORY.
1 Mar 65, 30p NASA-CR-74849, JPL-TM-33-197
Contract NAS7-100

Descriptors: Control, Facility, Firing, *High vacuum, Performance, Pressure, Radiation, Rocket, Simulator, Solar, *Solar radiation, Space, *Space simulator, Spacecraft, *Spacecraft performance, System, Temperature, Test, *Test facility, Vibration.

For abstract, see S 04 13.

N66-25160 **Field 14B**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
EXPLORATORY STUDY OF PERFORMANCE OF THE LANGLEY PILOT MODEL EXPANSION TUBE WITH A HYDROGEN DRIVER.
by J. J. Jones, and J. A. Moore. May 66, 55p
NASA-TN-D-3421

Descriptors: Driver, Expansion, Flow, *Flow velocity, Hydrogen, Hypersonic, *Hypersonic flow, Pressure, Reentry, *Reentry vehicle, Static, Tube, Turbulence, Vehicle, Velocity.

For abstract, see S 04 13.

N66-25309 **Field 14B**
CFSTI Prices HC$1.00 MF$0.50
Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
CONTINUOUS MEASUREMENT OF SHOCK VELOCITY USING A MICROWAVE TECHNIQUE.
by R. J. Blum, and M. G. Dunn. May 66, 36p
NASA-CR-490
Contract NAS5-3976

Descriptors: Apparatus, Continuous, Doppler effect, Measurement, Microwave, *Microwave apparatus, Propagation, Shock, *Shock wave, Signal, Technique, Tube, Velocity, *Velocity measurement, Wave.

For abstract, see S 04 13.

N66-25322 **Field 14B, 1B**
CFSTI Prices HC$2.00 MF$0.50
Deutsche Versuchsanstalt Fur Luft- Und Raumfahrt, Porz (West Germany).
D;VL-NEWS, NO. 29/30.
Dvl-nachrichten, Heft 29/30
by H. Ebner. Jan 66, 49p
In German

Descriptors: Activity, *Aerodynamics, Air, *Aircraft, Experiment, Flight, *Germany, Institute, Research, *Research facility, Space, *Space flight, Travel.

For abstract, see S 04 13.

N66-25469 **Field 14B, 22B**
CFSTI Prices HC$4.00 MF$1.00
Universidad Autonoma De San Luis Potosi (Mexico).
CONSIDERATIONS FOR THE INTEGRATION OF A TEST CENTER AND ROCKET LAUNCHER IN MEXICO.
Consideraciones Para La Integracion De Un Sitio De Prueba Y Lanzamiento De Cohetes En La Republica Mexicana
by F. J. Hernandez. 1966, 145p
In Spanish

Descriptors: Air, Atmosphere, Azimuth, Ballistics, Configuration, Cryogenics, Earth, *Earth atmosphere, Facility, Geodesy, Geophysics, Ground, *Ground support system, Hypergolic, Launching, Liquid, Mesosphere, Mexico, Payload, Propellant, Rocket, *Rocket test station, Satellite, *Satellite launching, Solid, Station, Support, System, Test.

For abstract, see S 04 14.

N66-25532 **Field 14B**
CFSTI Prices HC$4.00 MF$0.75
Advanced Kinetics, Inc., Costa Mesa, Calif.
NEW CONCEPTS FOR HIGH ENERGY RATE FORMING SYSTEM SUMMARY REPORT.
by R. W. Waniek. 27 Aug 65, 108p NASA-CR-74918
Contract NAS8-11758

Descriptors: Acoustic, Actuation, Coil, Design, Device, Diaphragm, Forming, High energy, High pressure, Hydraulic, Magnetic, *Magnetic forming, Plane, Pressure, *Pressure pulse, Pulse, Rate, Storage, *Storage device, *Transducer, Wave.

For abstract, see S 04 14.

N66-25593 **Field 14B**
CFSTI Prices HC$1.00 MF$0.50
India. Dept. Of Atomic Energy, Bombay.
INFRA-RED SPECTRUM OF 1, 1-DIFLUORO-2, 2-DICHLORO ETHANE.
by V. B. Kartha, N. A. Narasimham, and O. Santhakumari. 1964, 19p AEET/SPEC/9

Descriptors: Analysis, Band, Chlorine, Compound, Dipole, *Ethane, Fluorine, nfrared, *Infrared spectrum, Intensity, Liquid, Moment, Organic, Solid, Spectral, *Spectral analysis, Spectrum, State, Vapor.

For abstract, see S 04 14.

N66-25602 **Field 14B**
CFSTI Prices HC$3.00 MF$0.75
Aerodynamische Versuchsanstalt, Gottingen (West Germany).
INVESTIGATION OF A MODEL TUBE WIND-TUNNEL.
Untersuchungen Am Modell-rohrwindkanal
by T. Hottner. 14 Feb 64, 69p REPT.-64-A-04
In German Sponsored By Deut. Forschungsgemeinschaft

Descriptors: Air, Boundary, *Boundary layer, Chamber, Electric, Facility, Heating, Layer, Measurement, Nozzle, Pressure, *Pressure chamber, Supersonic, *Supersonic wind tunnel, Test, *Test facility, Tube, Tunnel, Wind.

For abstract, see S 04 14.

N66-25644 **Field 14B**
CFSTI Prices HC$2.00 MF$0.50
India. Dept. Of Atomic Energy, Bombay.
METALLIC HALIDE ELECTRODELESS DISCHARGE LAMPS.
by T. K. Balasubramanian, G. L. Bhale, P. C. Ghosh, and P. R. Rao. 1965, 30p AEET-236

Descriptors: Discharge, *Discharge tube, Electrodeless, Element, Excitation, Halide, Heavy, *Heavy element, Iron, *Lamp, Life, Line, *Line spectrum, Metal, *Metal halide, Method, Oscillator, Spectrography, Spectrum, Thorium, Tube, Uranium.

For abstract, see S 04 14.

N66-25821 **Field 14B**
CFSTI Prices HC$2.00 MF$0.50
European Atomic Energy Community, Brussels (Belgium).
A MEASUREMENT OF THE HYPERFINE STRUCTURE OF THE THERMAL FLUX DISTRIBUTION IN THE UC CLUSTERED FUEL ELEMENT ESSOR C-2-PHI.
by S. Guardini, and G. F. Pipitone. 1966, 48p
EUR-2714.E

Descriptors: Cluster, Deuterium, Distribution, Element, Flux, Fuel, *Fuel element, Heat, *Heat flux, Hyperfine, *Hyperfine structure, Material, *Materials testing reactor, Oxide, Reactor, *Reactor fuel, Structure, Testing.

For abstract, see S 04 14.

N66-26057 **Field 14B**
CFSTI Prices HC$2.00 MF$0.50
Societe D Etudes, De Recherches Et D Applications Pour L Industrie, Brussels (Belgium).
DYNAMIC CORROSION TESTS OF CARBON STAINLESS STEEL IN PRESSURIZED WATER.
Essais Dynamiques De Corrosion D'aciers Au Carbone Et Inoxydable Dans L'eau Pressurisee
by P. De dorlodot, M. Warzee, andR. Waty. Mar 66, 32p EUR-2688.F, EURAEC-1546
Contract EURATOM-089-62-7 RDB
In French, English Summary

Descriptors: Carbon, Corrosion, *Corrosion test, Dynamic, Electrolyte, Polishing, Pressure, Stainless, *Stainless steel, State, Steel, Surface, Test, Water, *Water pressure.

For abstract, see S 04 14.

N66-26059 **Field 14B**
CFSTI Prices HC$4.00 MF$0.50
France. Ministere De L Air, Paris.
STUDY OF THE INTERACTION OF SUPERSONIC JETS.
Etude De L'interaction De Jets Supersoniques
by D. Faulmann. 1966, 120p REPT.-422
1966 120 P Refs In French

Descriptors: Counter, Current, Flow, Hypersonic, *Hypersonic wind tunnel, Jet, Pipe, Pressure, Shock, *Shock wave, Stability, Supersonic, *Supersonic jet, Wave, Wind tunnel.

For abstract, see S 04 14.

N66-26287 **Field 14B**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.

EXPERIMENTAL ASSEMBLY AND STERILIZATION LABORATORY (EASL) OPERATIONS-PHASE I.
by T. R. Gavin, G. F. Kapell, and J. J. Mc dade.
15 Apr 66, 30p NASA-CR-75152, JPL-TR-32-941
Contract NAS7-100

Descriptors: Assembly, Contamination, Control, Design, Equipment, Ethylene, Facility, *Microbiology, Operation, Oxide, Personnel, Quality, Research, *Research facility, *Sterilization, Testing.

For abstract, see S 04 14.

N66-26547 **Field 14B**
CFSTI Prices HC$3.00 MF$0.75
Aerojet-general Corp., Sacramento, Calif.
LARGE SIZE CRYOGENIC TURBINE TYPE FLOWMETER TECHNOLOGY.
by G. R. Deppe. 1 Jun 66, 53p NASA-CR-54810, AGC-8800-60
Contract NAS3-2555

Descriptors: Calibration, Cleaning, Cost, Cryogenic, *Cryogenic equipment, Engine, Equipment, Flow, Handling, *M- 1 rocket engine, Turbine, *Turbine engine.

For abstract, see S 04 14.

N66-34325 **Field 14B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
MANUFACTURE OF LITHIUM-DRIFTED SILICON SURFACE-BARRIER SEMICONDUCTOR COUNTERS.
by N. Baron, and G. A. Kaminski. Aug 66, 24p NASA-TN-D-3554
Contract 129-02-04-06-22

Descriptors: Barrier, Charge, *Counter, Device, Drift, Etching, Lithium, Manufacture, Monocrystal, Mount, Particle, Polishing, Resolution, Semiconductor, *Semiconductor device, *Silicon, Surface.

For abstract, see S 04 20.

N66-34426 **Field 14B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Ames Research Center, Moffett Field, Calif.
CHARACTERISTICS OF A NEW TYPE BALANCE FOR WIND-TUNNEL MODELS.
by I. N. Chabra, E. L. Conley, J. Dimeff, and K. Mc farland. Aug 66, 25p NASA-TM-X-1278
Contract 125-24-03-05-00

Descriptors: Aerodynamic, *Aerodynamic force, Apparatus, Balance, Design, Fabrication, Force, Gauge, Measuring, *Measuring apparatus, Model, Sting, Strain, *Strain gauge balance, Test, Tunnel, Wind, *Wind tunnel model.

For abstract, see S 04 20.

N66-34428 **Field 14B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
CHARACTERISTICS, SELECTION AND USE OF RESIDUAL GAS ANALYZERS.
by W. W. Hultzman. Aug 64, 14p NASA-TM-X-1281

Descriptors: Analyzer, Characteristics, Coverage, Flexibility, Gas, *Gas analyzer, Mass, Model, Operation, Pressure, Reliability, Residual, *Residual gas, Resolution, Selection, Sensitivity, Spectrometry.

For abstract, see S 04 20.

N66-34672 **Field 14B**
CFSTI Prices HC$2.00 MF$0.50
Space Technology Labs., Inc., Redondo Beach, Calif.
A SINGLE-AXIS SPACE SIMULATOR FOR TESTING THE OGO ALTITUDE CONTROL SYSTEM.
by N. H. Beachley. Jul 63, 42p NASA-CR-77223, STL-2313-6007-KU-000

Descriptors: Attitude, *Attitude control, Axis, Cable, Calibration, Control, Cycle, Eclipse, Limit, Noon, *Ogo, Platform, Servo, Simulator, Single, Space, *Space simulator, Suspension, System, *Test method, Turn, Yaw.

For abstract, see S 04 20.

N66-34800 **Field 14B**
CFSTI Prices HC$1.00 MF$0.50
Illinois Univ., Urbana.
THEORETICAL AND EXPERIMENTAL STUDIES OF THE UNDERLYING PROCESSES AND TECHNIQUES OF LOW PRESSURE MEASUREMENTS SEMIANNUAL STATUS REPORT, 1 DEC. 1965 - 30 MAY 1966.
by R. N. Peacock. Aug 66, 9p NASA-CR-77333
Grant NSG-376

Descriptors: Adsorption, Auger effect, *Barkhausen effect, Characteristics, *Electrode, Gas, Gauge, Glass, Low pressure, Metal, Oscillation, Outgassing, Saturation, Structure, *Suppressor, Vacuum, *Vacuum gauge.

For abstract, see S 04 20.

N66-34939 **Field 14B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECTS OF RUBIDIUM VAPOR ON BAYARD-ALPERT IONIZATION GAGES AT PRESSURES LESS THAN 1 TIMES 10 MINUS 6 TORR.
by R. L. Summers. Sep 66, 12p NASA-TN-D-3574
Contract 125-24-03-01-22

Descriptors: Alkali, *Alkali metal, Bayard-alpert ionization gauge, Calculation, Condensation, Effect, Gauge, Grid, High pressure, Ionization, *Ionization gauge, Measurement, Metal, *Metal vapor, Photoelectric, *Rubidium, Sensitivity, Vapor, Voltage.

For abstract, see S 04 20.

N66-35143 **Field 14B, 18D**
CFSTI Prices HC$1.00 MF$0.50
Osterreichische Studiengesellschaft Fur Atomenergie G.m.b.h., Seibersdorf (Austria).
APPARATUS FOR TRANSMITTING MOTION IN A VACUUM SYSTEM.
Vorrichtung Zur Bewegungsuebertragung In Ein Vakuumsystem
by F. W. Edl. 1966, 10p SGAE-PH-41/1966
In German Submitted For Publication

Descriptors: Apparatus, Chamber, Equipment, Flexibility, *Laboratory apparatus, Motion, Movement, Object, Place, Position, *Positioning equipment, Structure, System, Vacuum, *Vacuum system.

For abstract, see S 04 20.

N66-35166 **Field 14B**
CFSTI Prices HC$3.00 MF$0.75
Arkansas Univ., Little Rock.
A HIGH VACUUM CHAMBER WITH A DYNAMIC SEAL FOR VARYING ION ATTITUDE AND VELOCITY RELATIVE TO THE ENTRANCE OF A MASS SPECTROMETER FINAL REPORT, PART I.
13 Jul 66, 58p NASA-CR-77447
Grant NSG-260

Descriptors: Attitude, Design, Dynamic, Entrance, Frequency, High vacuum, Instrumentation, Ion, *Ion bombardment, *Low pressure chamber, Mass, *Mass spectrometer, Radio, Rotary, *Sealing, Spectrometer, Velocity.

For abstract, see S 04 20.

N66-35266 **Field 14B**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
DSIF-WOOMERA.
1965, 30p NASA-CR-77601, JPL-TM-33-223
Contract NAS7-100

Descriptors: Acquisition, Antenna, *Australia, Communications, Data, *Data processing, *Deep space instrumentation facility (dsif), Exploration, Moon, Planetary, Probe, Processing, Signal, *Signal transmission, Space, Telemetry, Tracking, *Tracking antenna, Transmission.

For abstract, see S 04 20.

N66-35267 **Field 14B**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
DSIF-JOHANNESBURG.
1965, 31p NASA-CR-77600, JPL-TM-33-224
Contract NAS7-100
For Abstract See N66-35266 20-11

Descriptors: Acquisition, *Africa, Antenna, Communications, Data, *Data processing, *Deep space instrumentation facility (dsif), Exploration, Moon, Planetary, Probe, Processing, Signal, *Signal transmission, South, Space, Telemetry, Tracking, *Tracking antenna, Transmission.

For abstract, see S 04 20.

PB-170 713 **Field 14B**
CFSTI Prices: HC$2.00 MF$0.50
Naval Research Lab., Washington, D. C.
REPORT OF NRL PROGRESS.
Jul 66, 50p
Also available on subscription from CFSTI $10.00 per year domestic, $13.00 per year foreign.

Descriptors: (*Naval research, Reports), Neutron beams, Optical instruments, Display systems, Electricity, Mechanics, Metallurgy, Ceramic materials, Optics, Radio.

PB-170 855 **Field 14B, 21E**
CFSTI Prices: HC$3.00 MF$0.50
National Aviation Facilities Experiment Center, Atlantic City, N. J.
EVALUATION OF A THRUSTMETER FOR MEASURING IN-FLIGHT THRUST OF TURBOJET ENGINES.
Technical rept.
by Robert F. Salmon. Apr 66, 54p
Proj. FAA-520-004-01X
FAA-ADS-77

Descriptors: (*Thrust meters, Turbojet engines), (*Turbojet engines, Thrust), Flight testing.

An airborne type thrust measuring instrument was developed and subsequently tested on both a J79-GE-8 turbojet engine mounted on a thrust stand in a laboratory altitude cell and a JT3C-7 turbojet engine aboard a Boeing 720 aircraft. The thrustmeter system using measurements of internal engine pressures, ambient altitude pressure and total air temperature, computed engine gross thrust, net thrust and percent of maximum continuous rated thrust at the operating flight condition. Laboratory tests indicated that the thrustmeter gross thrust values were within + or -3.0% of the thrust stand measured values, and the thrustmeter net

thrust values were within + or -4.2% of the thrust stand measured net thrust. Flight test results indicated that the system functioned properly aboard the aircraft and was responsive to small changes in engine power setting. The thrustmeter gross thrust and net thrust values agreed with the computed gross and net thrust of the engine within + or -2.2% and + or -2.8% respectively. In measuring net thrust during the flight tests, some difficulty was encountered in obtaining consistent static pressure readings at the compressor inlet station thus causing errors in the computation of ram drag. (Author)

PB-170 863 **Field 14B, 13J**
CFSTI Prices: HC$1.60 MF$0.50
Virginia Polytechnic Inst., Blacksburg.
THE CONSTRUCTION AND CALIBRATION OF THE VPI TOWING BASIN.
Engineering Extension Series.
by M. Lowell Collier Jr. Jun 66, 25p Circular-7

Descriptors: (*Model basins, Performance (Engineering)), Construction, Calibration, Model tests, Effectiveness.

The report describes the V.P.I. towing basin and compares the results of tests on a standard model with tests run on the same model in several other basins. Because of the narrow width of the tank (six feet as compared to fifty-one feet for the D.T.M.B.), it was expected that the drag coefficient would be slightly higher than the unrestricted water drag coefficient. At the highest value of Froude number the value of C sub T for the model tested in the V.P.I. basin is approximately 6.5% higher than the D.T.M.B. value. The largest part of this difference is due to tank boundary effects. After correcting for tank boundary effects, the V.P.I. value of C sub T is only 2.5% higher than the D.T.M.B. value of C sub T at the highest value of Froude number. The values of C sub R for the lower values of Froude number are also better correlated after correcting for tank boundary effects. It should be noted that the Webb data for C sub T (a ten foot tank) is also 2.5% higher than the D.T.M.B. value of C sub T at this highest Froude number. Hughes method of correcting for tank boundary effects gives only an approximate correction factor, and does not correct to 'open water' condition. The important point here is that tests in VPI's six foot tank correlate well with tests in a ten foot tank after corrections for tank boundary effects have been applied. Both the six and twelve foot tanks suffer from the lack of a theory which corrects to 'open water' conditions. Results of tests in the VPI tank can be reproduced accurately. Table II shows tests on the standard model run at two different times approximately two months apart. The difference in the values of C sub T for the two tests is small. (Author)

PB-170 968 **Field 14B, 9C**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
MICROWAVE POWER METER HEWLETT-PACKARD 431A OR 431B SPERRY MICROLINE 66A1 AN/USM-177 PRD 686.
Technical manual instrument calibration procedure, GP-06.
1 Jun 66, 29p
NAVWEPS-17-20GP-06
This publication supersedes NAVWEPS 17-20GP-06 dated 15 Jul 1963.

Descriptors: (*Power meters, Calibration), Radiofrequency power, Specifications, Test methods, Instruction manuals.

The procedure describes the calibration of the AN/USM-177, Sperry Microline 66A1, PRD 686, or the Hewlett-Packard 431A or 431B power meter.

PB-170 986 **Field 14B, 9B**
CFSTI Prices: HC$2.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
VOLT-OHM-MILLIAMETERS.
Technical manual instrument calibration procedure AQ-14.
15 Jun 66, 41p
NAVWEPS-17-20AQ-14
This publication supersedes the interim edition released by the Metrology Engineering Center on 1 February 1964 and NAVWEPS 17-20AQ-14 of 21 September 1960 changed 1 November 1962.

Descriptors: (*Ammeters, Calibration), Voltage, Ohmmeter, Specifications, Test methods.

The procedure describes the calibration of volt-ohm-milliammeters. A list of instruments that can be calibrated by this procedure is given in the appendix.

PB-172 966 **Field 14B**
CFSTI Prices: HC$1.60 MF$0.50
Central Mechanical Engineering Research Inst., Durgapur (India).
ELECTRIC CRADLE DYNAMOMETER.
by P. R. Bhandary, M. S. Keshav, V. J. Chetty, and S. N. Bhagi. Nov 65, 15p CMERI-AI

Descriptors: (*Dynamometers, Design), Electrical equipment, Internal combustion engines, Test equipment, India.

The paper gives a brief resume of the different types of dynamometers in general use for power measurement, and reports the advantages of electric cradle dynamometer over the other types. Work was undertaken at the Central Mechanical Engineering Research Institute for converting DC machine into electric cradle dynamometer. The method of construction and other details of the dynamometer, fabricated at the Institute and now in use at the Institute for testing low horse power internal combustion engines, are given in full. (Author)

PB-173 075 **Field 14B, 9C**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
R. F. MILLIVOLTMETER MV-828A, MV-928A (MILLIVAC).
Technical manual instrument calibration procedure, AE-51.
15 Apr 66, 13p NAVWEPS-17-20AE-51

Descriptors: (*Voltmeters, Calibration), Radiofrequency, Voltage, Specifications, Test methods.

The procedure describes the calibration of the Millivac MV-828A or MV-928A R.F. Millivoltmeter, which is designed to measure radio frequency voltages from 0.001 to 3 volts full scale in the frequency range of 10 kHz to 1.2 GHz.

PB-173 076 **Field 14B, 9C**
CFSTI Prices: HC$1.00 MF$0.50
Data-Design Labs., Ontario, Calif.
OSCILLOSCOPES 310-310A-AN/USM-89 (TEKTRONIX).
Technical manual instrument calibration procedure, AW-41.
15 May 66, 21p
Contract N123 (62861)53723A
NAVAIR-17-20AW-41

Descriptors: (*Oscilloscopes, Calibration), Specifications, Test methods.

Identifiers: AN/USM-89.

The procedure describes the calibration of general purpose oscilloscopes with calibrated sweep rates, calibrated vertical sensitivities, a square-wave calibrator, and provisions for automatic or adjustable triggering from either internal or external sources.

PB-173 111 **Field 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
HYDROMETERS CONSTANT-MASS, VARIABLEDISPLACEMENT TYPE (EXCLUDING ALCOHOL TYPES) 0.645 TO 1.505 (60/60F) SPECIFIC GRAVITY USING ASTM PRECISION STANDARDS 0.700 TO 1.510 (60/60F) SPECIFIC GRAVITY USING BRAUN CHEMICAL CO. 34595 HYDROMETERS.
1 Jun 65, 18p
NAVWEPS-17-20MS-01
This publication supersedes the interim edition released by the Metrology Engineering Center on 1 April 1964.

Descriptors: (*Densimeter, Calibration), Liquids, Solutions, Surface tension, Specifications, Test methods.

The procedure describes the calibration of hydrometers of the constant-mass variable-displacement.

PB-173 112 **Field 14B, 9C**
CFSTI Prices: HC$1.00 MF$0.50
Burroughs Corp., Radnor, Penn.
RMS VOLTMETER MODEL 3400A.
Technical manual instrument calibration procedure AE-42.
1 Jul 66, 23p
Contract N123 (62861)35057A
NAVAIR-17-20AE-42
This publication supersedes NAVWEPS 17-20AE-42 dated 15 June 1965.

Descriptors: (*Voltmeters, Calibration), Voltages, Frequency, Response, Extremely low frequency, High frequency, Specifications, Test methods.

The procedure contains the information necessary for calibrating the HewlettPackard 3400A RMS Voltmeter. This portable instrument provides a means of measuring the actual root mean square (rms) value of alternating voltages between 1 m and 300 v rms with a frequency response of 10 cps to 10 Mc. Nonsinusoidal waveforms with a ratio of peak voltage to rms (crest factor) as high as 100 can be accurately measured with the Test Instrument. (Author)

PB-173 121 **Field 14B**
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center.
CALIBRATION OF REVERE TYPE C-2 AIRCRAFT ELECTRONIC WEIGHING KIT.
Technical manual instrument calibration procedure, MF-02.
15 May 66, 13p
NAVWEPS-17-20MF-02

Descriptors: (*Balances, Calibration), (*Airplanes, Balances), (*Calibration, Instruction manuals), Test methods, Test equipment, Electronic equipment.

AD-638 749 **See Field 13H**
AD-638 884 **See Field 11B**
AD-638 902 **See Field 17G**
AD-638 920 **See Field 8D**
AD-639 040 **See Field 5J**
AD-639 043 **See Field 5J**
AD-639 044 **See Field 5J**
AD-639 053 **See Field 13J**
AD-639 059 **See Field 22A**
AD-639 062 **See Field 11I**
AD-639 135 **See Field 17B**

AD-639 157 See Field 20D
AD-639 243 See Field 6E
AD-639 247 See Field 17B
AD-639 263 See Field 20I
AD-639 273 See Field 8J
AD-639 280 See Field 20F
AD-639 308 See Field 20D
AD-639 440 See Field 13H
N66-24413 See Field 4B
N66-24416 See Field 20F
N66-24829 See Field 11E
N66-24879 See Field 9A
N66-24892 See Field 20D
N66-35135 See Field 20D
N66-35139 See Field 1A
PB-170 710 See Field 20C
PB-170 810 See Field 9C
PB-170 811 See Field 9C
PB-170 882 See Field 9C
PB-170 883 See Field 9C
PB-170 884 See Field 9C
PB-170 885 See Field 9C
PB-170 886 See Field 9C
PB-170 887 See Field 9C
PB-170 938 See Field 9E
PB-170 939 See Field 9C
PB-170 940 See Field 9C
PB-170 941 See Field 9C
PB-170 985 See Field 9E
PB-170 987 See Field 9A
PB-172 422 See Field 9C
PB-172 961 See Field 9C
PB-172 962 See Field 9C
PB-172 963 See Field 9C
PB-172 964 See Field 9C
PB-173 087 See Field 9A
PB-173 110 See Field 9E
PB-173 120 See Field 9C
PB-173 122 See Field 9C
PB-173 123 See Field 9C

14C. RECORDING DEVICES

N66-25561 **Field 14C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TECHNIQUES FOR THE DESIGN, EVALUATION, AND ANALYSIS OF ENDLESS-LOOP TAPE TRANSPORTS FOR SATELLITE APPLICATIONS.
by K. W. Stark. May 66, 46p NASA-TN-D-3391

Descriptors: Amplitude, Characteristics, Data, *Data storage, Flutter, Information, Instrumentation, Modulation, Performance, *Performance characteristics, Power, Recorder, Satellite, Spacecraft, *Spacecraft instrumentation, Storage, Tape, *Tape recorder, Transport.

For abstract, see S 04 14.

14D. RELIABILITY

N66-34606 **Field 14D**
CFSTI Prices HC$2.00 MF$0.50
Michigan Univ., Ann Arbor.
USING RADIOKRYPTON FOR DETECTION OF LEAKS IN SPACE VEHICLES FINAL REPORT.
15 Jun 66, 34p NASA-CR-77304, IN-R-QUAL-66-6
Contract NAS8-2579

Descriptors: Acquisition, Concentration, Detection, Dilution, Element, Equipment, Gas, Isotope, *Krypton, *Leakage, *Radioactive isotope, Radioactivity, Rare, Rate, Space, *Space vehicle, Test, Trace, *Trace element, Vehicle.

For abstract, see S 04 20.

N66-34643 **Field 14D**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
EVALUATION OF CONTRACTOR QUALITY PROGRAM PLAN.
Jul 66, 43p NASA-TM-X-57841, RA-001-009-1A

Descriptors: Analysis, *Apollo project, Check, *Contractor, Control, Evaluation, Handling, Inspection, Numerical, Packaging, Preservation, Quality, *Quality control, Rating.

For abstract, see S 04 20.

N66-34644 **Field 14D**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
EVALUATION OF SUPPLIER INSPECTION PLAN.
Jul 66, 24p NASA-TM-X-57842, RA-001-010-1A

Descriptors: *Apollo project, Control, Evaluation, Handbook, *Inspection, Quality, Rating, System.

For abstract, see S 04 20.

N66-34645 **Field 14D**
CFSTI Prices HC$11.52 MF$4.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
FAILURE INFORMATION NOTEBOOK.
1 Mar 66, 853p NASA-TM-X-57844, SR-QUAL-66-4

Descriptors: Component, Electromechanical, Electronic, Equipment, *Failure, Ground, Mechanical, Operation, Rate, *Saturn i launch vehicle, Support.

For abstract, see S 04 20.

AD-639 567 See Field 11F

14E. REPROGRAPHY

AD-638 714 **Field 14E, 20E**
Not available from CFSTI.
Rochester Univ., N. Y. Dept. of Physics and Astronomy.
COLOR IMAGERY BY WAVEFRONT RECONSTRUCTION.
by L. Mandel. 24 Aug 65, 4p
Contract AF 49 (638)-1532
Proj. AF-9767
Task 976702
AFOSR-66-1273
Availability: Published in Journal of the Optical Society of America v55 n12 p1697-8 Dec 1965.

Descriptors: (*Images, Colors), (*Lasers, *Photographic techniques), Color photography.

Identifiers: Holography.

It is shown that the method of wavefront reconstruction developed by Leith and Upatnieks can be used virtually without modification to reconstruct images in color from black and white holograms. The requirement is a laser beam with three spectral components corresponding to the three primary colors. The color rendering will be undistorted provided the field of view is restricted to an angle of about 10 degrees. (Author)

AD-638 893 **Field 14E, 11G**
CFSTI Prices: HC$3.00 MF$0.75
General Electric Co., Syracuse, N. Y. Heavy Military Electronics Dept.
THIN FILM SENSITIVITY INVESTIGATION.
Rept. for Mar 64-Apr 65.
by J. Gaynor, S. Aftergut, and R. F. Kopczewski.
Jul 66, 68p
Contract AF 30 (602)-3668
Proj. AF-5534
Task 553401
RADC-TR-66-361

Descriptors: (*Films, Photoelectric materials), (*Photoelectric materials, *Electrophotography), Cadmium compounds, Sulfur compounds, Selenides, Doping, Copper, Chlorine, Photoconductivity, Sensitivity.

A multilayer medium for electroionic electrophotography was developed. A doped cadmium sulfoselenide photoconductor film was in electrical contact with a development layer through an anisotropically conducting separator (multilead glass). The separator protected the photoconductor from contamination by reagents in the development layer. A semitransparent gold layer and aluminum foil served as electrodes. A 20 millisec exposure simultaneous with the application of an electric field produced the image as an electrolytic deposit in the development layer without need for subsequent processing. The image is viewed after parting the layers. (Author)

AD-639 297 **Field 14E**
CFSTI Prices: HC$1.00 MF$0.50
Ballistic Research Labs., Aberdeen Proving Ground, Md.
A HIGH INTENSITY SHORT DURATION PHOTOGRAPHIC LIGHT SOURCE FOR USE AT LOW AMBIENT PRESSURE.
Technical note.
by Jack S. Williams. Jun 66, 19p BRL-TN-1618
Proj. RDT/E-1P014501A33E

Descriptors: (*Photographic lighting systems, High-speed photography), Spark shadowgraph photography, Sparks, Kerr cells, Intensity, Encapsulation.

The report describes an enclosed spark gap light source designed to be operated in a low pressure environment. While the light intensity from an open spark gap is greatly reduced at lower ambient pressures, the enclosed spark gap system maintains a constant light intensity through a range of ambient pressures from 760 millimeters to 100 microns of Hg. In addition, other electrical problems that occur at reduced pressures are eliminated. (Author)

AD-639 443 Field 14E
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
HIGH SPEED PHOTOGRAPHY.
by Chan Tai-hua. 11 Aug 66, 9p FTD-TT-65-724 TT-66-62341
Edited trans. of K'o Hsueh Hua Pao (Chinese People's Republic) n2 p46-8 1964.

Descriptors: (*High-speed photography, China), High-speed cameras.

N66-24422 Field 14E
CFSTI Prices HC$1.00 MF$0.50
Japan Broadcasting Corp., Tokyo.
16-MM EE CAMERA WITH MAGNETIC SOUND RECORDING.
by T. Saito. Feb 66, 18p S-6

Descriptors: Broadcasting, Camera, Design, Film, *Japan, Lightweight, Magnetic, *Magnetic tape recorder, Mechanism, Mobility, Performance, Prototype, Recorder, *Sound, Tape, Television, *Television camera.

For abstract, see S 04 13.

N66-24644 Field 14E
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PULSE TRAIN GENERATOR FOR ROCKET CAMERA.
by R. S. Lee. Jan 66, 14p NASA-TM-X-55454, X-614-66-37

Descriptors: Advance, Camera, *Camera shutter, Control, *Control device, Device, Film, Generator, Pulse, *Pulsed generator, Rocket, Sequence, *Sequential control, Shutter, Solid, *Solid state device, Sounding, State, Timing.

For abstract, see S 04 13.

N66-25579 Field 14E
CFSTI Prices HC$4.00 MF$1.00
Arizona Univ., Tucson.
6-INCH ULTRAVIOLET CAMERA FOR APOLLO FINAL TECHNICAL REPORT.
by A. B. Meinel, and W. G. Tifft. 1 Apr 66, 122p NASA-CR-65360, A66-02
Contract NAS9-5193

Descriptors: *Apollo project, Astronomy, *Camera, Design, Earth, Light, Mission, Observation, Optical, Orbital, Platform, Specification, Stabilization, System, Ultraviolet, *Ultraviolet light.

For abstract, see S 04 14.

N66-25635 Field 14E
CFSTI Prices HC$2.00 MF$0.50
ON THE ACCURACY OF AEROTRIANGULATION WITH CONVERGENT PHOTOGRAPHY.
by I. Hadem. 1965, 45p
Its Ser. A, No. 34

Descriptors: Aerial, Angle, *Convergence, Coordinate, Derivation, Equation, *Error, Mapping, *Mathematical model, Mathematics, Model, Observation, Orientation, Parallax, Photogrammetry, *Photography, *Triangulation, Vertical, Wide.

For abstract, see S 04 14.

N66-34860 See Field 20M

PB-173 171 See Field 5F

15A. ANTISUBMARINE WARFARE

AD-638 789 See Field 13J

15C. DEFENSE

AD-638 969 Field 15C
CFSTI Prices: HC$4.00 MF$0.75
Pittsburgh Univ., Pa. Dept. of Sociology.
THE IMPACT OF CIVIL DEFENSE INFORMATION I: AN EXAMINATION OF INFORMATION LEVELS.
by Dorothy B. Rosenberg. Jun 66, 101p
Contract OCD-OS-63-48, Grant NSF-G-11309

Descriptors: (*National defense, Civil defense systems), (*Civil defense systems, Public opinion), Nuclear warfare, Cold war, Warning systems, Arms control, Disarmament, Shelters, Nuclear weapons, United States, Aging (Physiology).

The purpose is to study the impact of Civil Defense information in terms of information levels. It examines levels of information about CD, cold war, effect of nuclear weapons, and arms control and disarmament efforts. Subjective levels of information on these four issues, based on a national block sample's self-imputed information, are compared with objective levels of information determined by other researchers, and these two measures of information levels are found to be compatible. While there is no way of knowing whether information people think they have is accurate, those who tend to feel they are informed about CD are women as well as men, Negroes as well as non-Negroes, those at all but the lowest level of education, those at all levels of income. The most important personal factors are related to respondent's age. Those who have high subjective CD information display a greater optimism about the future and are less inclined to want World War III or a Communist surrender because of U. S. technological supremacy; they favor all shelter programs and tend to feel that the present warning system is very good. The findings imply that: (1) there is little need to try to convince the American people that CD measures are desirable or warranted; (2) CD messages can afford complete frankness in depicting to the nation both the promise and the limitations of protective measures. (Author)

AD-639 387 Field 15C, 5C
CFSTI Prices: HC$3.00 MF$0.75
Hudson Inst., Inc., Harmon-on-Hudson, N. Y.
CRISIS PREPARATIONS FOR POSTATTACK ECONOMIC RECOVERY.
Research rept.
by Frederick C. Rockett, and William M. Brown.
15 Jul 66, 55p HI-661-RR
Contract OCD-PS-65-64

Descriptors: (*Civil defense systems, *Economics), Urban areas, United States, Transportation, Industrial plants, Underground structures, Factories, Food, Recovery.

The report concerns a civil defense policy for the protection of economic assets. It describes the size and general character of the assets at risk in standard attacks against cities and it describes the size and nature of U.S. transportation resources. The point is made that in a few days U.S. transportation resources are sufficiently large to permit relocation of a sizable fraction of the equipment and inventory risk, perhaps 50%. The remaining equipment and assets might be protected by such measures as burying or locating them in basements. Even structures could be made somewhat survivable. Crisis actions in these categories might be possible in a week or less of intense effort by a mobilized population. Short-term actions to protect property might assure economic recovery following a heavy city-attack. Other actions are possible in longer periods. For example, relocating and resuming production at some factories may be possible given weeks and months. Food stores seem to be open to considerable increase. Given a year, it might be possible to relocate some plants to underground sites and to implement many other potentially important actions designed to facilitate postattack recovery. Peacetime preparations for crisis actions could increase the number of options available and the efficiency with which they could be implemented. (Author)

AD-639 564 Field 15C
CFSTI Prices: HC$1.60 MF$0.50
RAND Corp., Santa Monica, Calif.
THE USE OF MANNED SIMULATION IN THE DESIGN OF AN OPERATIONAL CONTROL SYSTEM.
by M. A. Geisler, and W. A. Steger. 1961, 13p P-2322
Presented at the Joint IRE-AIEE-ACM Computer Conference, Los Angeles, Calif., May 9-11, 1961. Research sponsored in part by Inst. of Radio Engineers, American Inst. of Electrical Engineers and Assoc. for Computing Machinery.

Descriptors: (*Weapon systems, Design), (*Simulation, Manned), (*Control systems, Weapon systems), Guided missiles, Computers, Data processing systems.

Identifiers: LP-11 data processing system.

The paper describes the general features of the planning and operations phases of a new weapon system. The uncertainties inevitable in planning mean that considerable effort is made during the operations phase to adjust the weapon system and its resources to the actual environment it finds so as to attain the desired level of operational capability. The adjustment mechanism is called an operational control system. Elements of such an operational control system are described. The proposal is made that a better control system can be designed if simulation is used to help design it during the planning phase. The use of simulation will not only produce a better control system earlier but it will permit the planners to adjust the other resources provided for the weapon system so that they are compatible with the environment and the control system. An example of such a study is described. (Author)

AD-639 104 See Field 17B

AD-639 559 See Field 17E

15D. INTELLIGENCE

AD-639 126 Field 15D, 5H, 5E
CFSTI Prices: HC$2.00 MF$0.50
System Development Corp., Falls Church, Va.
STUDY OF TWO IMAGE INTERPRETER MAP DISPLAYS: CHIP VERSUS HARD COPY.
Technical research note.
by Richard S. Laymon, Robert Sadacca, and Joseph Zeidner. May 66, 37p
Contract DA-49-092-ARO-65
Proj. DA-R/D-PJ-2J620901A721
APRO-TRN-169

Descriptors: (*Maps, Display systems), (*Optical images, Photointerpretation), (*Aerial reconnaissance, Display systems), Computers, Man-machine systems.

Comparison was made of two methods of displaying reference maps for the use of image interpreters in a tactical image interpretation facility (TIIF). Image interpreters were required to perform two tasks -- to match imagery to a reference map and then to estimate the coordinates of a point on the image. Time taken to reach correct solutions was compared when reference maps were displayed from simulated slide chips (map sections projected onto a fixed screen) and when hard-copy map chips (standard presentation) were used. Measures of performance with both display modes were obtaiged under experimental conditions where the image would appear on one or two chips. Two conditions of imagery orientation for each map display mode were also imposed: one in which position of the imagery was fixed and one

in which the imagery could be freely oriented to the map display. Separate analyses of variance were conducted on time scores from the matching and locating tasks. The following major conclusions were derived: (1) Display of map information upon a screen instead of by hard copy increased time taken by an interpreter to match imagery and to determine map coordinates of an object on an image; the longer time required when the interpreters used map chips was attributable to need to study two slides when the imaged area lay on the boundary of one or both chips. (2) Freedom to orient an image relative to a map display did not affect time taken to complete either the matching or the locating task. (Author)

15E. LOGISTICS

AD-639 601 **Field 15E, 5A**
CFSTI Prices: HC$3.00 MF$0.75
RAND Corp., Santa Monica, Calif.
INTEGRATING BASE MAINTENANCE MANAGEMENT BY UNIFYING ITS INFORMATION SYSTEMS IN MANUAL AND COMPUTER-ASSISTED ENVIRONMENTS.
by I. K. Cohen, E. V. Denardo, and P. J. Kiviat.
Jun 66, 71p RM-4849-PR
Contract AF 49 (638)-1700

Descriptors: (*Military facilities, Maintenance), (*Maintenance, *Management control systems), (*Logistics, Inventory control), Computers, Air force operations, Real time.

Identifiers: Information systems.

Suggestions for improving maintenance management by unifying the information system and by integrating the many functions of the team. The suggested innovations are: (1) integration of several manual data acquisition systems around the ongoing control of flight-line maintenance; (2) the extension of this integration to allied maintenance functions; (3) use of a computer to generate documents for the management of preplanned activities; (4) integration of other maintenance functions with No. (3); and (5) full use of an on-line computer for further improvement of the real-time function and coordination of several maintenance management functions. These steps are to be viewed as a general guide rather than as a rigid sequence of implementation. (Author)

AD-639 602 **Field 15E**
CFSTI Prices: HC$2.00 MF$0.50
RAND Corp., Santa Monica, Calif.
AN INTERDICTION MODEL OF HIGHWAY TRANSPORTATION.
by Eugene P. Durbin. May 66, 32p RM-4945-PR
Contract AF 49 (638)-1700

Descriptors: (*Roads, *Tactical warfare), (*Transportation, Tactical warfare), Logistics, Programming (Computers), Vehicles, Maintenance, Cargo vehicles.

Identifiers: Highways, Interdiction.

The memorandum describes a computer program that demonstrates the effect of denying the use of a portion of a highway transportation network. The program evaluates the capability of transportation networks to deliver supplies, as road segments of arcs of the network are successively destroyed and repaired. The program, written in FORTRAN IV, can be adapted for any of several large-scale computers. Required inputs are a description of the considered transportation road system and the cargo-carrying vehicles using it. The program furnishes a profile of maximum cargo flow as a function of the number of vehicles available to the system, then destroys the link in the network that reduces cargo flow rate most severely. These steps are repeated until network flow is stopped or predesignated links destroyed. The program then steps to the next 'period,' restores service to all previously destroyed links now repaired, and repeats the process of profile generation and link removal. The program will accept a network up to 1000 links. (Author)

PB-173 252 **Field 15E, 5A, 13M**
CFSTI Prices: HC$5.00 MF$1.25
National Bureau of Standards, Washington, D. C.
THE OPPORTUNITY FOR BUILDING SYSTEMS INNOVATION IN THE MILITARY CONSTRUCTION PROGRAM OF THE DEPARTMENT OF DEFENSE.
Oct 65, 172p
Proj. NBS-4002410

Descriptors: (*Military facilities, *Systems engineering), Buildings, Design, Construction, Armed forces procurement, Feasibility studies, Military requirements, Management engineering.

The feasibility study was conducted in essentially three stages. The first stage involved a preliminary exploration of market opportunities within the military program and potential industrial interest, and an examination of the management procedures used in facilities procurement. The second stage covered a more detailed analysis of the market and a search for ways to overcome certain obstacles encountered in the first stage. The final stage involved the design of a pilot project and the framing of specific recommendations for proceeding. These three stages are discussed in detail. (Author)

AD-638 744 **See Field 12B**

AD-639 163 **See Field 12A**

AD-639 190 **See Field 17A**

PB-172 869 **See Field 5B**

15F. NUCLEAR WARFARE

AD-639 303 **See Field 13M**

AD-639 446 **See Field 18H**

AD-639 594 **See Field 13L**

15G. OPERATIONS, STRATEGY, AND TACTICS

AD-638 787 **See Field 19E**

AD-638 805 **See Field 5I**

AD-639 030 **See Field 5I**

PB-170 836 **See Field 17B**

16D. MISSILES

AD-483 130 **Field 16D, 19A, 6R**
CFSTI Prices: HC$7.00 MF$1.50
Vitro Labs., Silver Spring, Md.
DIGITAL COMPUTER PROGRAM FOR DETERMINING EFFECT OF HIGH-LEVEL RF EXPOSURE ON MISSILE SYSTEMS.
Final rept.
by Carl L. Frederick, Donald S. Moseley, Robert C. Stroh, Don H. Cook, and Harry P. Bird. 15 May 66, 259p
Contract DA-01-021-AMC-12734 (Z)
AMC-RE-TR-66-10

Descriptors: (*Electric igniters, Radiation hazards), (*Guided missiles, Radiation hazards), Electric detonators, Explosive initiators, Electromagnetic waves, Digital computers, Programming (Computers), Electrical properties, Electromagnetic capability, Guided missile personnel, Launching, Rocket motors.

The development of a general digital computer program, is described, to predict the current flowing in an Electrical Initiator (EI), connected to a 'Receptor' circuit of a typical missile syste, as a result of the effects of high level radio system frequency ambient radiation. The program is based on an analysis of current flow resulting from induced electromotive forces of any value, acting in the series arms of any or all sections of a ladder type network. Included are the effects of mutual coupling from neighboring 'Interfering' circuits, effects of stray capacitance to shields, unbalance, and leakage of electromagnetic energy through apertures in the missile metallic shielding. The electrical length of the network sections are taken sufficiently short to allow lumped values of series and shunt impedances to be used, such that the networks are equivalent, for all practicable purposes, to transmission lines with distributed impedances. The general program is written in FORTRAN IV language for IBM 7090 or 7094 computers. The standard 32K storage is sufficient for about 40 Interfering lines coupling into the Receptor line, each having up to 150 network sections. More sections can be handled if the number of Interfering lines is reduced. The computer automatically prints and plots the total current flowing in the EI, as a result of numerical values of radiation field intensity and parameters applicable to a given missile configuration. Values for a typical missile system are chosen and a sample problem solved. (Author)

N66-24400 **Field 16D**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE EFFECT OF A FIN TRAILING-EDGE WEDGE ON THE ROLL HISTORY OF A NIKE APACHE.
by H. L. Galloway Jr. Feb 66, 89p NASA-TM-X-55463, X-721-66-85

Descriptors: Aerodynamics, Attitude, Deflection, Edge, Effect, Fin, Flight, Flow, *Flow deflection, History, *Nike-apache rocket, Rocket, Roll, *Roll attitude, Trailing, *Trailing edge, Wedge.

For abstract, see S 04 13.

17A. ACOUSTIC DETECTION

AD-639 190 **Field 17A, 15E**
CFSTI Prices: HC$1.00 MF$0.50
Human Resources Research Office, George Washington Univ., Alexandria, Va.
POSSIBLE COMBAT APPLICATION OF EXPERIMENTAL STEALTH MEASURING DEVICE.
Research memo.
by Frank L. Brown. Jan 59, 22p HumRRO-RM-9

Descriptors: (*Acoustic detectors, *Combat surveillance), Loudspeakers, Transistor amplifiers, Monitors, Acoustic equipment.

The employment of highly portable, relatively inexpensive listening devices on the forward edge of the battle area, defile and route approaches, and at rear area installations such as prisoner-of-war compounds and supply and ammunition dumps may be considered worthwhile. Centralized monitoring, avoidance of strict demands for line-of-sight conditions, and operation not greatly affected by darkness or other conditions of limited visibility appear to be favorable possibilities. Both man-made and natural sounds may interfere with the detection and interpretation of more pertinent sounds of lesser intensity. However, this is only one of several problems presently confronting the operator of a combat listening post not equipped with a listening device. The arrays employed during the experiment were rather quickly adjusted to serve the specific experimental purpose, so no great experience was gained which might serve as a basis for forecasting performance in another

role. It is emphasized that the device was not designed or tested for combat use; however, the apparent potential is such that further experimentation at U.S. Army Signal Corps or similarly equipped laboratories may be warranted to determine the suitability of such a device for a combat surveillance role. Information set forth in the appendices should facilitate design, construction, and installation of similar surveillance equipment by interested agencies.

PB-170 804 **Field 17A, 9E**
CFSTI Prices: HC$2.00 MF$0.50
National Aviation Facilities Experimental Center, Atlantic City, N. J.
TEST OF A GENERAL AVIATION TRANSPONDER MODIFIED TO INCORPORATE A CRYSTAL VIDEO RECEIVER.
Final rept.
by Robert A. Waldmann. Apr 66, 30p
Proj. FAA-242-006-02X
SRDS-RD-66-27
See also PB-170 759.

Descriptors: (*Transponders, Crystal video receivers), (*Crystal video receivers, Transponders), Design, Performance (Engineering), Radar beacons, Airborne, Air traffic control systems, Tests.

Tests of a modified General Aviation Transponder incorporating a crystal video receiver were performed in order to determine whether it is technically feasible to use this type of receiver in the design of future radar beacon transponders. The modified GAT met specifications or performed as well as the unmodified GAT during most tests; however, the unmodified GAT exhibited a low gain-bandwidth product. It was concluded that the technique of using a crystal video receiver in place of the superheterodyne receiver in radar beacon transponders is technically feasible, and when designed as an integral part of a new transponder, may effect a reduction in the cost, weight, or power consumption of the transponder. It was recommended that this technique be considered in the design of future radar beacon transponders. (Author)

17B. COMMUNICATIONS

AD-483 045 **Field 17B**
CFSTI Prices: HC$2.00 MF$0.50
Mitre Corp., Bedford, Mass.
HF CHANNEL DATA ERROR STATISTICS DESCRIPTION (II).
by Kenneth Brayer, and Otto Cardinale. May 66, 31p MTR-172
Contract AF 19 (628)-5165
Proj. 705B
ESD-TR-66-107
See also AD-636 300.

Descriptors: (*Radio communication systems, *Data transmission systems), (*Radio transmission, High frequency), Errors, Functions, Probability, Tables, Digital systems, Statistical distributions, Coding, Statistical data.

A description of bursts and corresponding intervals in terms of probability distribution function parameters for varying error densities is presented. This statistical data is based on the 1965 Antigua-Ascension HF digital data transmission tests conducted by The MITRE Corporation. (Author)

AD-638 911 **Field 17B**
CFSTI Prices: HC$6.00 MF$1.25
ITT Federal Labs., Nutley, N. J.
APPLIED RESEARCH STUDY ON SATELLITE COMMUNICATIONS.
Final rept. no. 5, 1 Jan 65-30 Jun 66.
by M. Epstein, M. Weinberg, I. Krause, E. Imboldi, and R. Gollhardt. 30 Jun 66, 206p
Contract DA-28-043-AMC-00442 (S)
Proj. DA-1-R-3-32-101-D-253

Descriptors: (*Space communication systems, *Communication satellites (Active)), State-of-the-art reviews, Communication equipment, Limiters, Transponders, Coding, Automatic gain control, Power, Control systems, Multiple operation.

The purpose of this applied research study is to advance the state of the art in the field of satellite communications. The study is divided into two task areas: (1) Multiple access techniques consists of studies in four prime areas: device effects on transmission, optimum coding study, time division multiple access study, and design study for the ADCSP. (2) Current ground environment design covers ground power control in multiple access systems, multichannel loading of small channel capacity military communication systems, and investigation of fm threshold extension techniques.

AD-639 058 **Field 17B, 9E**
CFSTI Prices: HC$3.00 MF$0.75
University of New England, Armidale (Australia). Dept. of Physics.
C-W OPERATION OF SPARK TRANSMITTERS.
Final rept.
by K. Landecker. May 66, 68p
Grant Nonr (G)-0009-64

Descriptors: (*Radiofrequency oscillators, Sparks), (*Radio transmitters, Sparks), Australia, Transformers, Transmission lines, Dielectrics, Synchronizing switches, High frequency.

Identifiers: Spark transmitters.

A spark oscillator and transmitter was developed producing undamped ('C-W') oscillations at frequencies of 10 Mc/s. with the aid of a special type of Ferrite transformer and slow wave transmission lines with ceramic high permittivity dielectric. The production of R.F. oowers in the Megawatt range and the extension of the frequency range to about 100 Mc/s are envisaged but have not been achieved so far mainly because of insulation difficulties. High frequency switching devices other than Ferrite transformers such as shock wave switches and solid state rectifiers have been investigated but found unsuitable for the production of sustained oscillations. (Author)

AD-639 084 **Field 17B, 5I**
CFSTI Prices: HC$1.00 MF$0.50
Purdue Research Foundation, Lafayette, Ind.
SYLLABLE DURATION AND INTENSITY RELATED TO INTELLIGIBILITY.
Technical rept.
by J. C. Kelly, G. L. Draegert, G. L. Shaffer, P. Roberts, and F. Willmarth. 22 Jul 49, 21p
Contract N6ori-104 (02)
Projs. 20-K-1, NR-782-003
SPECDEVCEN-104-2-15

Descriptors: (*Speech, *Intelligibility), (*Voice communication systems, Intelligibility), Intensity, Auditory perception, Noise, Aircraft, Training, Time.

Identifiers: Syllables.

The purpose of the investigation was to determine the relation of syllable duration and intensity to speech intelligibility. Three conditions of R/T communication were studied: (a) subjects talking over R/T circuits in quiet (no aircraft noise in headset) prior to voice communication instruction; (b) subjects talking over R/T circuits with aircraft noise in headset prior to training; and (c) subjects talking over R/T circuits with noise after two hours of voice communication instruction. The relationships of syllable duration and intensity to speech intelligibility in these three situations were studied. (Author)

AD-639 086 **Field 17B, 5J**
Not available from CFSTI.
Purdue Univ., Lafayette, Ind. Voice Science Lab.
REVISED CONCEPT OF RATE.
by J. C. Kelly, and M. D. Steer. 1948, 6p
Contract N6Ori-104-02
Proj. NR-782-003
SPECDEVCEN-104-2-16
Availability: Published in The Journal of Speech and Hearing Disorders v14 p222-6 Sep 1949.

Descriptors: (*Speech, Velocity), Analysis of variance, Verbal behavior.

The investigation considered elements of rate and judgment of rate of the extemporaneous speech of 24 college speakers in beginning public speaking course. The results must necessarily be confined to extemporaneous speech in a classroom situation and to the particular analysis employed. With these limitations the following conclusions seem warranted: (1) Extemporaneous speech is extremely variable in rate, ranging from 125 to 328 words per minute on the average. Over-all rate fails to reveal this variability. Over-all rate also fails to reveal the true talking rate. It appears that the sentence by sentence analysis method would come closer to revealing the true speaking rate as well as the true variability of rate. (2) It is probable that the sentence rate method of describing extemporaneous speech is more highly related to audience judgment than is over-all rate of speaking. (Author)

AD-639 088 **Field 17B, 5J, 5I**
CFSTI Prices: HC$1.00 MF$0.50
Purdue Research Foundation, Lafayette, Ind.
THE MANUAL-VERBAL RESPONSE TACHISTOSCOPE: DISTRACTING DEVICE FOR INTELLIGIBILITY TESTING.
Technical rept.
by D. K. Wilson. 1 Jun 50, 21p
Contract N6ori-104 (02)
Projs. NR-782-003, 20-K-1
SPECDEVCEN-104-2-20

Descriptors: (*Intelligibility, Psychometrics), (*Tachistoscopes, Intelligibility), Noise, Interference, Auditory perception, Psychomotor tests, Training, Speech.

The report describes the Purdue Manual-Verbal Response Tachistoscope, which is an instrument designed to measure intelligibility under conditions of distracting psychomotor activity. The intelligibility testing involves the use of a standardized intelligibility test and the psychomotor tasks consist of eye-hand coordination manipulations. The Purdue Manual-Verbal Response Tachistoscope was designed primarily for research and training in intelligibility under conditions involving high-level noise. Use of the instrument in combination with Navy Device 8-1, Portable Interphone Trainer makes possible the determination of the effect on voice communication of psychomotor tasks more or less complex in nature, requiring greater or less precision and rapidity of voluntary hand movements. (Author)

AD-639 094 **Field 17B**
CFSTI Prices: HC$3.00 MF$0.75
Purdue Research Foundation, Lafayette, Ind.
A STUDY OF THE INTELLIGIBILITY CHARACTERISTICS OF SEVEN ITEMS OF MILITARY PUBLIC ADDRESS EQUIPMENT.
Technical rept.
by R. C. Bilger. 6 Jun 51, 73p
Contract N6ori-104 (02)
Projs. 20-K-1, NR-782-003
SPECDEVCEN-104-2-24

Descriptors: (*Public address systems, *Intelligibility), (*Speech, Intelligibility), Noise, Auditory perception, Effectiveness.

The purpose of this test was to determine the maximum distance that intelligible speech can be projected, by the test items, throughout a 360 degree pattern in the presence of simulated battle noise of known intensity.

AD-639 095 Field 17B, 5I
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
RELATIONSHIPS BETWEEN VOICE VARIABLES AND SPEECH INTELLIGIBILITY IN HIGH LEVEL NOISE.
Human engineering rept.
by G. L. Draegert, and T. D. Hanley. Oct 52, 14p
Contract N6ori-104 (02)
SPECDEVCEN-104-2-25

Descriptors: (*Speech, *Intelligibility), (*Voice communication systems, Intelligibility), Noise, Interference, Auditory perception, Military training, Intensity, Time, Sound pitch.

The investigation isolates those variables which seem to change intelligibility in military situations in which a talker must compete with the noise of planes, gunfire, and other battle confusion. Analyses were made of the voices of both good and poor speakers. The variables compared were intensity, speech time, voice quality, and pitch factors. Loudness was the most significant single factor that differentiated high and low intelligibility. Increased loudness improves intelligibility. Syllable and word duration affected intelligibility. A longer duration helps intelligibility. The other voice variables did not seem to be important. (Author)

AD-639 096 Field 17B, 5I
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
A FURTHER INVESTIGATION OF THE RELATIONSHIPS BETWEEN VOICE VARIABLES AND SPEECH INTELLIGIBILITY IN HIGH LEVEL NOISE.
Technical rept.
by R. C. Bilger, T. D. Hanley, and M. D. Steer.
13 Apr 55, 19p
Contract N6ori-104 (02)
Proj. 20-F-8
SPECDEVCEN-104-2-26

Descriptors: (*Speech, *Intelligibility), (*Voice communication systems, Intelligibility), Noise, Interference, Auditory perception, Military training, Phonetics, Sound pitch, Intensity.

A study was undertaken to determine the relationships between talker intelligibility in noise and several voice variable measures derived from intensity, duration and pitch analyses of several speech samples. In addition, the best combination of the voice variables for predicting speech intelligibility in noise was determined. A talker intelligibility score as well as measures on 14 speech variables were determined from an analysis of speech samples obtained from 88 subjects. Product-moment intercorrelations among all the variables were computed. All the relationships between talker intelligibility in noise and the voice variables investigated were found to be linear. Mean syllable intensity and mean syllable duration were found to make the highest contribution to talker intelligibility scores. When combined with other speech variables, intensity and duration were most highly correlated with pitch variability. A multiple correlation coefficient of 0.88 was found for the relationship between talker intelligibility in noise and mean syllable intensity, mean syllable duration and pitch variability. (Author)

AD-639 097 Field 17B, 5I
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
THE RELATIONSHIP BETWEEN TALKER INTELLIGIBILITY AND MESSAGE FAMILIARITY.
Technical rept.
by R. C. Bilger, Bernard Spilka, T. D. Hanley, and M. D. Steer. 28 Oct 54, 9p
Contract N6ori-104 (02)
Proj. 20-F-8
SPECDEVCEN-104-2-30

Descriptors: (*Speech, *Intelligibility), (*Military training, ntelligibility), Noise, Auditory perception, Visual perception, Recall, Speech recognition, Effectiveness, Voice communication systems.

The study was designed to determine the extent to which talker intelligibility in noise is related to the talker's familiarity with the message to be transmitted. Two groups equated with respect to talker intelligibility were tested under different conditions designed to give the talkers differing degrees of familiarity with the message to be transmitted. One group merely heard the words they were to repeat; the second group received additional cues from multiple-choice answer sheets which provided aids in selecting nd pronouncing the words. The data obtained from 92 subjects indicate that the group given visual cues in ddition to auditory cues achieved a significantly higher mean intelligibility score than the group who only heard the words to be transmitted. (Author)

AD-639 099 Field 17B, 5I
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
COMMUNICATION IN NOISE: SUCCESS RELATED TO THREE DEGREES OF EMPHASIS ON VERBAL CONTEXT.
Technical rept.
by I. Miller, R. C. Bilger, T. D. Hanley, and M. D. Steer. 13 Dec 54, 15p
Contract N6ori-104 (02)
Proj 20-F-8
SPECDEVCEN-104-2-36

Descriptors: (*Speech, *Intelligibility), (*Military training, Intelligibility), Vocabulary, Noise, Performance tests, Effectiveness, Voice communication systems.

The purpose of the experiment was to investigate what effect minimizing or emphasizing attention to an objective verbal context will have upon the intelligibility of spoken words when the amount of information and signal-to-noise ratio are held constant. The subjects were administered multiple-choice intelligibility tests under noise conditions by the following methods: (1) The subject cheched the words heard among four alternatives for each test item. (2) The subject whispered four alternatives before the test word was spoken. (3) The subject did not see the alternatives before the word was spoken by the experimenter. The data collected in this study indicate that listener scores are improved under the condition in which verbal context of the test items is stressed; on the other hand, listener scores are lessened under the condition in which the verbal context is minimized. The broad implication of the study is that time soent by listener-talkers in studying the nomenclature they must communicate will be repaid by more efficient communications. (Author)

AD-639 103 Field 17B, 5J, 6R
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
THE RELATION BETWEEN DURATION OF EXPOSURE TO HIGH LEVEL NOISE AND LISTENER ACCURACY.
Technical rept.
by G. L. Shaffer, R. C. Bilger, T. D. Hanley, and M. D. Steer. 13 Dec 54, 19p
Contract N6ori-104 (02)
Proj. 20-F-8
SPECDEVCEN-104-2-38

Descriptors: (*Speech, *Intelligibility), (*Noise, Kearing), (*Hearing, Performance tests), Exposure, Voice communication systems, Tolerances (Physiology), Auditory acuity.

The experiment was desigged to discover whether noise exposure results in impaired listening ability in a situation in which the individual remains in the noise environment and the listening test stimuli are presented at a constant level with respect to the noise level. For this purpose, four Listening-in-Noise tests were administered to an-experimental and a control group. Between tests, the experimental subjects removed their headphones in the presence of the test noise; the control subjects removed their headphones when the testing noise was cut off and spent the interval between tests in quiet. Within both groups, subjects were exposed to noise and tested over a fifty-minute period while others were tested over a period of three hours and twenty-five minutes. During either period, listener performance was not affected by exposure to noise between tests. The performances of experimental and control groups were parallel from test to test. During the fifty-minute period, successive test scores were significantly different; during the three-hour and twenty-five minute period, successive test scores were not significantly different. (Author)

AD-639 104 Field 17B, 5J, 15C
CFSTI Prices: HC$2.00 MF$0.50
Purdue Univ., Lafayette, Ind.
AN INVESTIGATION OF LISTENER ACCURACY IN AN ENVIRONMENT OF RELEVANT CONFLICTING VOICE SIGNALS.
Technical rept.
by J. W. Asher, T. D. Hanley, and M. D. Steer.
13 Dec 54, 26p
Contract N6ori-104 (02)
Proj. 20-F-8
SPECDEVCEN-104-2-39

Descriptors: (*Voice communication systems, Human engineering), (*Speech, *Intelligibility), Positioning reactions, Auditory perception, Combat information centers, Intensity, Auditory perception, Signals.

The present investigation makes use of the general design of the combat information center to test the influence of four situational aspects on the information conveying efficiency of the system. The four factors tested were the location of loudspeakers and the intensity levels at which the speakers operate, the position of the message source with respect to the bodily orientation of the listener, and the specific codeword which identified for the listener the message to which he was to respond. Spatial separation of loudspeakers resulted in higher listener scores than in the banked speaker position. Higher listener scores were obtained with a playback intensity level of 60 db than with a level of 75 or 90 db. There were significant differences in listener scores when the codewords identifying the messages differed. There were no significant differences in listener scores when the subject's left or right shoulder was facing the speaker. However, when the subject faces the speaker, listening scores are significantly improved. (Author)

AD-639 106 Field 17B, 5I
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind.
A FACTOR ANALYSIS OF TWELVE PHYSICAL MEASURES OF VOICE.
Technical rept.
by J. W. Asher, T. D. Hanley, and M. D. Steer.
18 Feb 57, 14p
Contract N6ori-104 (02)
Proj. 20-F-8
NAVTRADEVCEN-104-2-48

Descriptors: (*Speech, *Intelligibility), (*Voice communication systems, Intelligibility), Intensity, Time, Sound pitch, Factor analysis, Acoustic properties, Military training.

The following four factors emerged from the analyses: time, power, power variability, and pitch variability. Although the importance of vocal intensity and syllable duration in voice intelligibility are well recognized, the findings of this study indicate that pitch variability and power (intensity) variability are also important to good voice communications. Consequently, communications training programs designed to improve speech intelligibility should include instruction and drill in these variables. (Author)

AD-639 135 **Field 17B, 14B**
Not available from CFSTI.
National Research Council of Canada, Ottawa (Ontario). Div. of Radio and Electrical Engineering.
SOLID STATE PROGRAM TIMER CONTROLS OUTPUT OF STATION CHU.
by J. C. Swail. 1966. 4p
NRC-9182
Availability: Published in Canadian Electronics Engineering. Sep 1966.

Descriptors: (*Clocks, Time signals), (*Time signals, Control systems), Canada, Solid state physics, Radio stations, Radio signals, Radio equipment.

AD-639 180 **Field 17B**
CFSTI Prices: HC$1.10 MF$0.50
Naval Medical Research Lab., New London, Conn.
AN EVALUATION OF THE DUNBAR-KNIGHT HEARING GUARD.
Memo rept.
by J. Donald Harris. 20 Apr 60. 7p MR-60-7
NAVMED-MR005.14-0200.01.01

Descriptors: (*Earphones, Effectiveness), Hearing, Thresholds (Physiology), Audiometry, Voice communication systems, Attenuation, Noise, Frequency.

A Dunbar-Knight hearing guard was assessed with the threshold shift method using ten normal-hearing ears, and the results compared with those of the standard Navy V-51 ear plug. The attenuation provided in the frequency region 1,500 - 8,000 cycles is of the order of 20-25 db. Attenuation at 1,000 cycles and below is of the order of 10 db or less, and will allow speech communications to pass unhindered. It is recommended that this hearing guard, with its lead mass which will absorb a pressure wave, be assessed at a facility which has standardized techniques for assessing the effect on hearing of impulsive noises. (Author)

AD-639 247 **Field 17B, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Navy Electronics Lab., San Diego, Calif.
COMBINED-ENVIRONMENT TESTING OF SHIPBOARD ELECTRONIC EQUIPMENT: ANALYSIS OF DATA.
Research rept. for May 66.
by Floyd Robinson. 29 Jun 66. 14p NEL-1385
Projs. SF0131404, NEL-R11461
Task 5788

Descriptors: (*Electronic equipment, Shipborne), (*Environmental tests, Electronic equipment), Statistical analysis, Correlation techniques.

Identifiers: AN/SRC-16, Regression analysis.

A regression analysis was performed on data previously recorded during a combined-environment test on an intermediate frequency, amplitude modulation module, part of the signal converter of the Communications Central AN/SRC-16. The results showed that the technique is promising as an aid to assessing the effects of combined-environment testing, particularly for identifying the environmental factor that plays the principal part in performance deterioration. (Author)

AD-639 254 **Field 17B, 9D**
CFSTI Prices: HC$2.00 MF$0.50
Mitre Corp., Bedford, Mass.
CHARACTERISTICS AND UTILIZATION OF FORWARD-ACTING ERROR CONTROL EQUIPMENT FOR DATA COMMUNICATIONS.
by Larry L. Stine. Aug 66. 33p MTR-216
Contract AF 19(628)-5165
Proj. 705B
ESD-TR-66-295

Descriptors: (*Data transmission systems, Errors), (*Mathematical models, Data transmission systems), Communication systems, Corrections.

A mathematical model is developed which provides criteria for utilizing, in an optimal fashion, forward error correction devices for retransmission data communications systems. The devices are specified in terms of delay and error correction capability. System performance is described by the defined terms of error correction improvement factor; information throughput, and channel availability. (Author)

AD-639 380 **Field 17B, 5J**
Not available from CFSTI.
Johns Hopkins Univ., Jamestown, R. I. Systems Research Field Lab.
ACCURACY OF ORAL TRANSMISSION OF TARGET INFORMATION.
Revised ed., Memo rept.
by A. Chapanis. 1 May 52. 13p
SPECDEVCEN-166-1-5
Revision of manuscript submitted 1 Dec 46.
Published in unidentified journal.

Descriptors: (*Data transmission systems, Effectiveness), (*Performance (Human), Errors), Memory, Voice communication systems, Targets, Speech.

The experiment measured the speed and accuracy with which target (bearing and range) information can be transmitted orally over sound-powered telephones. Most of the errors in the oral transmission of target information are made by the recorder who must receive the information, remember it momentarily, and write the information down. Very few errors are made by the talker, and in general they do not exceed 2 (of the total, even at the highest reading rates. There is a constant low level of average error (less than 2%) in target information transmitted orally when the rate of reading is 10 targets or less per minute. Errors in target information at reading rates of 12, 14, and 16 targets per minute increase markedly, and at 16 targets per minute reach an average value of 25.5%. This means that at a rate of 16 targets per minute, more than one in every four targets relayed by telephone and then recorded contains an error. At high transmission rates the percentage of incorrect targets increases and, in addition, the errors are more serious because more digits per incorrect target are missed. (Author)

AD-639 559 **Field 17B, 15C, 13M**
Not available from CFSTI.
RAND Corp., Santa Monica, Calif.
PROTECTION OF COMMUNICATIONS AND ELECTRONIC SYSTEMS.
by F. R. Eldridge. 13 Apr 59. 14p P-1657
Presented at the General Problems Session of the RAND Protective Construction Symposium (2nd) held in Santa Monica, Calif., on 24 Mar 59.

Descriptors: (*Communication systems, Shelters), Underground structures, Electronic equipment, Scattering, Communication equipment.

In order to protect vital communications circuits for hardened sites, it may be necessary to resort to the use of many different types of communication systems which are independently vulnerable to the various methods which could be used to disrupt them. Hardening as well as dispersal will be required. By means such as these it appears feasible to meet the growing wartime threats to communications and electronic systems.

AD-639 618 **Field 17B, 5I**
CFSTI Prices: HC$11.60 MF$0.75
Purdue Research Foundation, Lafayette, Ind.
TRAINING MANUAL FOR PORTABLE INTERPHONE TRAINER, DEVICE 8-1 (VOICE COMMUNICATION).
Technical rept.
by G. L. Draegert, J. C. Kelly, M. W. Buck, and T. D. Hanley. 31 Jul 48. 120p
Contract N6ori-104-02
Proj. NR-782-003 (17)
SPEDEVCEN-104-2-12

Descriptors: (*Speech, *Intelligibility), (*Training devices, Instruction manuals), Voice communication systems, Portable, Intercommunication systems.

The manual was prepared for use with Training Device 8-1 in a speech intelligibility training program. An attempt was made to provide the instructor with (1) basic information, founded on research, about voice communication; (2) specific operating instructions for recommended communication training and testing devices; (3) a training program, including minimum and optional stages, which has been demonstrated to achieve desired results; and (4) recommended testing procedures to assess the effects of training. (Author)

NBS-TN-18-26 **Field 17B, 4A, 20N**
CFSTI Prices: HC$0.45 MF$0.50
Environmental Science Services Administration, Boulder, Colo. Inst. for Telecommunication Sciences and Aeronomy.
QUARTERLY RADIO NOISE DATA MARCH, APRIL, MAY 1965.
by W. Q. Crichlow, R. T. Disney, and M. A. Jenkins. 2 May 66. 80p
Also available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.45.
See also NBS-TN-18-25.

Descriptors: (*Radio interference, Data), (*Atmospherics, Data), Tables, Atmospheric electricity, Radiofrequency interference, Power, Voltage.

Radio noise measurements are being made at eighteen stations in a world-wide network operated in a co-operative program co-ordinated by the Environmental Science Services Administration. The results of these measurements for the months of March, April, and May 1965 are given in the report. The tabulated values are based on three basic parameters of the noise; these are the mean power, the mean envelope voltage, and the mean logarithm of the envelope voltage.

N66-24513 **Field 17B**
CFSTI Prices HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SYSTEMS COMPARISON OF DIRECT AND RELAY LINK DATA RETURN MODES FOR ADVANCED PLANETARY MISSIONS.
by T. A. Barber, J. M. Billy, and R. D. Bourke.
15 Feb 66. 81p NASA-CR-74653, JPL-TM-33-228
Contract NAS7-100

Descriptors: Communication, *Communication system, Direct, Landing, Launch vehicle, Link, Lunar, *Lunar landing module, Mission, Mode, Module, Planetary, Radio, Relay, *Relay satellite, Return, Satellite, *Saturn ib launch vehicle, System, Trajectory.

For abstract, see S 04 13.

N66-24688 **Field 17B**
CFSTI Prices HC$5.00 MF$1.25
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SPACE TRACKING AND DATA ACQUISITION NETWORK FACILITIES REPORT (;STADAN).
Dec 65. 192p NASA-TM-X-55438, X-530-66-33

Descriptors: Acquisition, Antenna, Data, *Data acquisition, Equipment, *Facility, Instrumentation, Radar, *Radar equipment, Satellite, Spacecraft, *Spacecraft tracking, Tracking.

For abstract, see S 04 13.

N66-24990 Field 17B
CFSTI Prices HC$5.00 MF$1.25
Collins Radio Co., Dallas, Tex.
DESIGN ANALYSIS - UNIFIED S-BAND SYSTEM FOR APOLLO NETWORK, VOLUME 3, PART V (CONT.) ENGINEERING REPORT.
9 Nov 64, 186p NASA-CR-74713
Contract NAS5-9035
Its Rept.- 523-0556527-001d3m

Descriptors: Analysis, *Apollo project, Communication, Data, Demodulation, Design, Equipment, Ground, *Ground station, Processing, *S-band, Signal, *Signal processing, Specification, Station, System, Tracking, *Tracking station.

For abstract, see S 04 13.

N66-25015 Field 17B
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
INFORMATION TRANSFER SYSTEMS IN SPACE COMMUNICATIONS.
by A. Dabul. May 66, 88p NASA-TN-D-3405

Descriptors: Audio, Channel, Checkout, Command, Communication, *Communication system, Data, *Data transmission, *Information, Lunar, Mars, Mission, Planet, Space, *Space communication, System, Telemetry, Tracking, Transfer, Transmission, Venus, Visual.

For abstract, see S 04 13.

N66-26258 Field 17B
CFSTI Prices HC$2.00 MF$0.50
Polytechnic Inst. Of Brooklyn, N. Y.
A SPACE COMMUNICATIONS STUDY PROGRESS REPORT, SEP. 15 - MAR. 15, 1966.
by K. K. Clarke, R. L. Pickholtz, and D. L. Schilling. 1966, 32p NASA-CR-74967
Contract NGR-33-006-020

Descriptors: Communication, *Communications device, Device, Discriminator, Estimator, Frequency, *Frequency modulation, Generator, Instrumentation, Lock, Modulation, Phase, *Phase lock, Signal, *Signal discriminator, Space, *Space communication, Technique.

For abstract, see S 04 14.

N66-26288 Field 17B
CFSTI Prices HC$4.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SPACE PROGRAMS SUMMARY NO. 37-38, VOLUME III FOR THE PERIOD JANUARY 1 TO FEBRUARY 28, 1966. THE DEEP SPACE NETWORK.
31 Mar 66, 116p NASA-CR-75155, JPL-SPS-37-38, VOL. III
Contract NAS7-100

Descriptors: Communication, *Communication system, Deep, *Deep space, Distance, Interplanetary, *Interplanetary space, Network, Space, Spacecraft, System, Travel, Two, Unmanned, *Unmanned spacecraft, Way.

For abstract, see S 04 14.

N66-26416 Field 17B
CFSTI Prices KC$5.60 MF$0.50
Norwegian Defence Research Establishment, Kjeller.
LONG RANGE PROPAGATION STUDIES ANNUAL SUMMARY REPORT NO. 1, 15 SEP. 1964 - 15 JUL. 1965.
by K. Folkestad. 10 Sep 65, 52p E-64, AFCRL-66-11
Contract AF 61/052/-835

Descriptors: Aurora, *Backscatter, Communications, Long, *Long range, Mode, Oblique, Operation, Propagation, Range, Ray, Reflection, *Sounding, Tracing, Wave, *Wave propagation.

For abstract, see S 04 14.

N66-26866 Field 17B
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
MARINER MARS 1964 TELECOMMUNICATION SYSTEM.
by J. A. Hunter. 1 Dec 65, 21p NASA-CR-75274, JPL-TR-32-836
Contract NAS7-100

Descriptors: Command, *Command system, Communication, Communications, *Mariner iv space probe, Mariner program, Performance, Probe, Radio, *Radio communication, Space, Spacecraft, *Spacecraft communications system, Subsystem, System, *Telecommunication, *Telemetry.

For abstract, see S 04 14.

PB-170 395 Field 17B, 4B, 1E
CFSTI Prices: HC$3.00 MF$0.75
Federal Aviation Agency, Washington, D. C. Systems Research and Development Service.
MODERNIZED WEATHER TELETYPEWRITER COMMUNICATIONS SYSTEM.
Technical rept.
Mar 66, 84p RD-66-21
Rept. on System Description.

Descriptors: (*Teletype system, Airports), (*Meteorological parameters, Data transmission systems), (*Weather communications, Teletype systems), Communication systems, Networks, Data processing systems, Real time, Air traffic control systems.

Identifiers: Weather Message Switching Center.

The document defines and describes a teletypewriter communications system designed to effect the collection and exchange of weather reports, forecasts and other related weather data on a national basis. It also provides for the exchange of data to and from overseas meteorological organizations. It is the primary digital data transfer system supporting the National Weather Services of the Weather Bureau, The Aviation Weather Services of the FAA and also provides a major support to the military weather services. This design centralizes, consolidates and automates the message switching functions of the existing weather teletypewriter Services A, C, and O within the Weather Message Switching Center (WMSC). It reconfigures circuitry and reschedules data distribution to more effectively meet users requirements. The WMSC is a solid state, real time, communications type, electronic data processor operating as a centralized store and forward message switch to automatically control and perform all polling, collection, storage, selection and redistribution functions related to the handling of weather and Notices to Airmen (NOTAM) message traffic carried by the system. (Author)

PB-170 836 Field 17B, 5H, 15G
CFSTI Prices: HC$1.10 MF$0.50
Pennsylvania Research Associates, Inc., Philadelphia, Pa.
INFORMATION PROCESSING RELATIONSHIPS IN A GENERALIZED COMMAND CONTROL SYSTEMS MODEL.
by Donald F. Blumberg. Sep 63, 5p
Reprinted from the Proceedings of the National Convention on Military Electronics (7th) Washington, Sep 1963. NSF Scientific Documentation Project.

Descriptors: (*Command + control systems, Data processing systems), Man-machine systems, Military requirements, Military strategy, Model tests.

The analysis, while only a condensed sample of a more elaborate study, demonstrates that research into the information processing relationships in a generalized command control systems model offers a fruitful area for further investigation. Study thus far suggests that transition from one mode to another (e.g., passive to active) are the most critical points in the information flow within the system. At such a time the basic command control function at the strategic level is not so much a question of what action to take (which is often based upon intuitive judgment as it is upon quantitative computation), but rather when to take it. Break-off decisions (stopping one type of activity, and initiation of another) appear to be those which could be materially improved through the use of mechanized techniques. This suggests that greater attention should be given to the design of the planning and decision support subsystem. (Author)

AD-638 758 See Field 9C

AD-639 085 See Field 5I

AD-639 098 See Field 5I

AD-639 105 See Field 5I

AD-639 107 See Field 5J

AD-639 211 See Field 20I

AD-639 246 See Field 20C

AD-639 253 See Field 20N

AD-639 435 See Field 8K

AD-639 570 See Field 5A

NBS-TN-337 See Field 4A

PB-170 967 See Field 17I

PB-172 402 See Field 17G

PB-173 073 See Field 4B

PB-173 150 See Field 13B

17C. DIRECTION FINDING

AD-639 358 Field 17C, 5J
CFSTI Prices: HC$5.60 MF$0.50
Mount Holyoke Coll., South Hadley, Mass. Psychophysical Research Unit.
ACCURACY, VARIABILITY AND SPEED OF ADJUSTING AN INDICATOR TO A REQUIRED BEARING.
Memo rept.
by S. Rogers, E. L. Kaufman, T. W. Reese, and J. Volkmann. 1947, 58p
SPECDEVCEN-166-1-MHC4

Descriptors: (*Direction finding, Performance tests), Display systems, Visual perception, Decision making, Analysis of variance.

The report is one of a series on the judgment of bearing, or angular orientation about the center of a circular display. A knowledge of how these judgments of bearing are made, their accuracy, their variability, their speed, is basic to the understanding of one of the fundamental perceptual tasks in the CIC'S. In the studies reported here, the subjects were shown a large circular display on which was a line of light (similar to a bearing cursor). They were told a certain bearing and their task was to adjust the line of light to what they thought was that bearing. They were allowed all the time they wished, but their time to adjust was recorded. All six subjects showed a surprising degree of accuracy even though the display contained no grid or other indication of bearing. This

accuracy was greatest and variability least at the vertical, and the horizontal. There was also an increase in accuracy and a decrease in variability in the region of 45 degrees. (Author)

AD-639 359 Field 17C, 5J
CFSTI Prices: HC$2.00 MF$0.50
Mount Holyoke Coll., South Hadley, Mass. Psychophysical Research Unit.
ACCURACY AND VARIABILITY OF DIRECT ESTIMATES OF BEARING FROM LARGE DISPLAY SCREENS.
Memo. rept.
by S. Rogers, J. Volkmann, T. W. Reese, and E. L. Kaufman. 1947, 33p
SPECDEVCEN-166-1MHC-1

Descriptors: (*Direction finding, Performance tests), Viewing screens, Visual perception, Psychometrics, Analysis of variance.

A series of studies of the estimation of bearing indicates that a surprising degree of accuracy can be attained when a large number of estimates are combined. This group accuracy can be attained without special training and without the aid of bearing markers, thanks to the fact that the normal individual has a fairly clear notion, under normal conditions, of the location of the vertical and horizontal and can, with somewhat reduced accuracy, make interpolations between them. Findings indicate that there is no appreciable difference between men and women in this report. Individual accuracy and variability are relatively independent of the length of the line whose bearing is to be judged, and of its distance from the center of the display screen, but the introduction of a reference line or bearing marker increases the accuracy and lowers the variability of estimates. The stabilizing effect of such a reference line extends over a sufficient distance to suggest that a grid composed of a small number of lines might be sufficient to insure adequate accuracy. Presumably this would mean a saving in the time required for making the estimates, without sacrificing accuracy. (Author)

N66-24485 Field 17C
CFSTI Prices HC$3.00 MF$0.75
Auburn Research Foundation, Inc., Ala.
A VHF DIRECTION FINDING SYSTEM TECHNICAL REPORT NO. 5.
by H. M. Summer. 19 Jan 66, 84p NASA-CR-74008
Contract NAS8-11251

Descriptors: Antenna, *Antenna array, Array, Direction, Electronics, Element, Equipment, Finder, Four, Frequency, High, Radar, *Radar direction finder, Radio, System, *Very high frequency radio equipment.

For abstract, see S 04 13.

AD-638 903 See Field 9E

PB-170 856 See Field 9E

17E. INFRARED AND ULTRAVIOLET DETECTION

AD-639 223 Field 17E, 20L
CFSTI Prices: HC$3.00 MF$0.50
Naval Research Lab., Washington, D. C.
DETECTOR INVESTIGATION FOR 8-15 AND 100-4000 MICRON REGIONS.
Semiannual technical summary rept. no. 20, 1 Jan-30 Jun 66.
by R. F. Wallis, and H. Shenker. Jul 66, 56p NRL-MR-1712
ARPA Order-269-62
See also AD-628 870.

Descriptors: (*Infrared detectors, Semiconductor devices), (*Semiconductors, Infrared detectors), Germanium, Doping, Beryllium, Indium alloys, Antimony alloys, Cadmium alloys, Arsenic alloys, Crystal growth.

Identifiers: Indium antimonide, Cadmium arsenide, Defender project.

Contents: Doped germanium detectors, InSb research, Materials preparation.

N66-25173 Field 17E
CFSTI Prices HC$2.00 MF$0.50
Deutsche Versuchsanstalt Fur Luft- Und Raumfahrt, Oberpfaffenhofen (West Germany).
METHODS FOR THE MEASUREMENT OF THE POLAR DIAGRAM OF THE I R-RADIATION INTENSITY FROM AIRPLANES.
Messmethoden Zur Messung Der Infrarot-strahlungscharakteristik
en Von Flugzeugen
by F. Katheder, and G. Miosga. Feb 65, 43p
DLR-FB-65-11
In German, English Summary

Descriptors: Aircraft, Data, Diagram, Emission, G-91 aircraft, Infrared, *Infrared radiation, Intensity, Jet, Jet aircraft, Measurement, Method, Polar, Radiation, Radiation emission, Recording, Reduction.

For abstract, see S 04 13.

N66-35308 Field 17E
CFSTI Prices HC$4.00 MF$1.00
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
APOLLO INFRARED ACQUISITION AND TRACKING SYSTEM SUMMARY REPORT.
by H. L. Richard. Sep 65, 148p NASA-TM-X-57016, X-524-65-290
Submitted For Publication

Descriptors: Acquisition, Airborne, *Airborne equipment, *Apollo spacecraft, Command, Detector, Equipment, Infrared, *Infrared detector, Module, Reentry, Spacecraft, *Spacecraft reentry, System, Tracking, *Tracking system, Vehicle.

For abstract, see S 04 20.

AD-476 584 See Field 4A

AD-638 919 See Field 14B

17G. NAVIGATION AND GUIDANCE

AD-481 366 Field 17G
CFSTI Prices: HC$1.00 MF$0.50
Naval Research Lab., Washington, D. C.
AIRBORNE OMEGA RECEIVER.
Interim rept. no. 4.
by R. J. Lampkin, T. E. Leonard, and A. F. Thornhill. 15 Jun 61, 16p NRL-MR-1182
See also AD-481 365.

Descriptors: (*Radio receivers, *Hyperbolic navigation), Airborne, Very low frequency, Aircraft equipment, Phase measurement, Mechanical drawings.

Techniques for the Omega navigation system are being developed to permit its use in aircraft. Omega utilizes a hyperbolic grid of isophase lines established by VLF transmitters. It is characterized by very long range capability and potentially high accuracy. This report is concerned with progress on the airborne receiver. (Author)

AD-638 723 Field 17G, 1E, 12B
CFSTI Prices: HC$1.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
A SUMMARY OF SOME DIGITAL SIMULATIONS RELATING TO RUNWAY UTILISATION.
Technical rept.
by M. R. Abbott. Mar 66, 24p TR-66087

Descriptors: (*Runways, Operation's research), (*Mathematical models, Queueing theory), Digital systems, Simulation, Scheduling, Programming (Computers), Traffic, Great Britain.

The report describes some idealised digital simulation models of runway utilisation, which have been studied at the Royal Aircraft Establishment over the past few years. A model is described first which demonstrates the benefit of a regular schedule under steady conditions, even with considerable unpunctuality. An extension of this is then described with a time-dependent arrival rate; two alternative queue disciplines are considered and two types of traffic schedule. The queue performance is obtained in each case for different values of traffic intensity and for different values of a parameter representing the quality of schedule-keeping. A brief description is given of the Atlas programme written for these simulations. (Author)

AD-638 902 Field 17G, 14B
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
DETERMINING MAXIMUM VALUES OF GRAVITATIONAL DRIFT AND DRIFT FROM UNEQUAL RIGIDITY OF FLOATING INTEGRATION GYROSCOPES.
by G. A. Slomyanskii. 31 Aug 66, 15p FTD-TT-66-63
TT-66-62241
Unedited rough draft trans. of Aviatsionnyi Tekhnologicheskii Institut, Moscow. Trudy (USSR) v59 p74-82 1964.

Descriptors: (*Gyroscopes, Drift), (*Gravity, *Drift), Moments, USSR.

AD-638 979 Field 17G
CFSTI Prices: HC$2.00 MF$0.50
Human Factors Research, Inc., Santa Barbara, Calif.
GEOGRAPHIC ORIENTATION IN AIRCRAFT PILOTS: SPEED CONTROL INVERSION.
Technical rept.
by James J. McGrath, Paul R. Christensen, and William J. Osterhoff. Jul 66, 44p TR-751-7
Contract Nonr-4218 (00)
Proj. NR-213-028

Descriptors: (*Pilots, *Navigation), Position finding, Errors, Performance (Human), Performance tests.

An experiment was conducted to investigate the incidence of inversion errors in the control of airspeed. Sixteen pilots were tested in a laboratory task that required them to make speed control decisions similar to those made during flight for the purpose of achieving a preplanned time of arrival. The results showed that pilots had little difficulty in deciding whether or not a change in speed was necessary, but frequently made errors in deciding which direction to change it. That is, pilots often decided to decrease speed when the correct response was to increase speed, and vice versa. The question of whether or not inversion errors in speed control occur during actual flight is discussed, and some of the factors that may influence the occurrence of such errors are examined. (Author)

AD-639 554 Field 17G
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
APPLICATION OF THE INVARIANCE THEORY TO THE SYNTHESIS OF INERTIAL NAVIGATIONAL SYSTEMS.
by E. G. Smenkovskii. 7 Jun 66, 17p FTD-TT-65-1860
TT-66-62360
Unedited rough draft trans. of mono. of Teoriya Invariantnosti v Sistemakh Avtomaticheskogo Upravleniya, Moscow, 1964 p449-56 (Published as Vsesoyuznayd Soveshchaniya Sostoyavshego-

sya (no. 2) Kiev, 29 May-1 Jun 62. Trudy, Moscow, 1964, p449-56).

Descriptors: (*Inertial navigation, Instrumentation), Synthesis, Invariance, Theory, USSR.

N66-25190 Field 17G
CFSTI Prices HC$2.00 MF$0.50
Deutsche Versuchsanstalt Fur Luft- Und Raumfahrt, Oberpfaffenhofen (West Germany).
TRANSMISSION OF CHARACTERISTIC DATA AND DISTANCE MEASUREMENT IN AIRPLANES.
by TH. Feger. Dec 65, 49p DLR-FB-65-63, DVL-429
In German, English Summary

Descriptors: Accessory, Air, *Air traffic control, Aircraft, Communication, Control, Data, *Data transmission, Device, Distance, *Distance measuring equipment, Equipment, Ground, *Ground station, Measurement, Relay, Station, System, Traffic, Transmission.

For abstract, see S 04 13.

N66-25547 Field 17G
CFSTI Prices HC$5.00 MF$1.25
Stanford Research Inst., Menlo Park, Calif.
INFORMATION REQUIREMENTS FOR GUIDANCE AND CONTROL SYSTEMS.
by C. H. Dawson, W. H. Foy Jr, R. E. Larson, L. Meier III, and J. Peschon. May 66, 188p NASA-CR-453
Contract NAS2-2457

Descriptors: Adaptive, Control, *Control system, Controller, Guidance, *Guidance and control, Handling, Information, *Information theory, Optimal, *Optimal control, Optimization, Subsystem, System, Theory.

For abstract, see S 04 14.

N66-25551 Field 17G
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Ames Research Center, Moffett Field, Calif.
SIMPLIFIED CALCULATION OF TRANSITION MATRICES FOR OPTIMAL NAVIGATION.
by J. S. White. May 66, 44p NASA-TN-D-3446

Descriptors: Analysis, Computer, Gravitational, *Gravitational potential, Kalman-schmidt filter, Mathematics, Matrix, Navigation, *Optimization, Potential, Requirement, Space, *Space navigation, Storage, Transition.

For abstract, see S 04 14.

N66-26262 Field 17G
CFSTI Prices HC$2.00 MF$0.50
New York Univ., N. Y.
A TOPOLOGICAL APPROACH TO THE PROBLEM OF SEARCHING ON A CONTOUR MAP.
by S. P. Morse. Jan 66, 41p NASA-CR-74970
Contract NGR-33-016-038
Its Tech. Rept.-400-129

Descriptors: Aircraft, Analysis, Contour, Ground, *Ground track, Height, *Map, Position, *Positioning, Profile, Search, *Terrain, *Topology, Track.

For abstract, see S 04 14.

N66-26272 Field 17G
CFSTI Prices HC$4.00 MF$1.00
Iit Research Inst., Chicago, Ill.
ANALYSIS OF AN OPTIMAL CELESTIAL-INERTIAL NAVIGATION CONCEPT FOR LOW-THRUST INTERPLANETARY VEHICLES.
by A. L. Friedlander. May 66, 142p NASA-CR-457
Contract NAS2-2401

Descriptors: Celestial, *Celestial navigation, Electric, *Electric propulsion, Filter, Flight, Gimbal, Interplanetary, *Interplanetary flight, Linear, Monitor, Navigation, Propulsion, Stellar.

For abstract, see S 04 14.

N66-26699 Field 17G
CFSTI Prices HC$3.00 MF$0.75
Auburn Univ., Ala.
AN INTRODUCTION TO ANALYTIC PLATFORMS FOR INERTIAL GUIDANCE.
by J. L. Lowry. Apr 66, 99p NASA-CR-75074
Contract NAS8-20004

Descriptors: Accelerometer, Analysis, Apparatus, Axis, Coordinate, Gyroscope, *Gyroscopic pendulum, Inertial, *Inertial accelerometer, Mathematics, Matrix, Measurement, *Measuring apparatus, Navigation, *Navigation system, Operation, Pendulum, Platform, Reference, Single, Stability, *Stabilized platform, System, Transformation, Vehicle.

For abstract, see S 04 14.

N66-26779 Field 17G
CFSTI Prices HC$1.00 MF$0.50
Technisch Documentatie En Informatie Centrum Voor De Krijgsmacht, The Hague (Netherlands).
REVIEW OF LITERATURE ON AIR NAVIGATION TECHNIQUES.
Literatuuroverzicht Luchtvaarttechniek
12 Apr 66, 23p
In Dutch, English, And German Its Vol. 14, No. L-294

Descriptors: *Abstract, Aerodynamics, Air, *Air traffic control, Annotation, *Bibliography, Control, Deicer, *Deicing system, Flight, *Flight safety, Paint, Personnel, Propulsion, Safety, System, Traffic, Training, Vibration.

For abstract, see S 04 14.

N66-26825 Field 17G
CFSTI Prices HC$4.00 MF$0.75
Auburn Research Foundation, Inc., Ala.
ANALYTIC PLATFORM SIMULATION.
by J. L. Lowry. Apr 66, 105p NASA-CR-75254
Contract NAS8-20004

Descriptors: Acceleration, Angular, *Angular velocity, Computer, *Computer simulation, Coordinate, *Coordinate system, Fixed, Fortran, Linear, *Linear accelerator, Platform, Position, Printout, Sensor, Simulation, System, Vehicle, Velocity.

For abstract, see S 04 14.

N66-26881 Field 17G
CFSTI Prices HC$4.00 MF$0.75
Massachusetts Inst. Of Tech., Cambridge.
A STATISTICAL ANALYSIS OF GYRO DRIFT TEST DATA, VOLUME I.
by J. R. Cooper. Sep 65, 106p NASA-CR-75226, TE-13
Contract NGR-22-009-078

Descriptors: Analysis, Computer, *Computer simulation, Drift, *Error, Gyroscope, *Gyroscopic drift, Inertial, *Inertial navigation, Model, Navigation, Output, Rate, Simulation, Statistical, *Statistical analysis.

For abstract, see S 04 14.

N66-34576 Field 17G
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Ames Research Center, Moffett Field, Calif.
USE OF REACTION WHEELS AND NONLINEAR CONTROL FOR A SATELLITE SCANNING A SMALL CELESTIAL AREA.
by F. G. Edwards. Aug 66, 53p NASA-TN-D-3592

Descriptors: Area, Astronomy, Celestial, *Celestial observation, Control, Motor, *Oao, Observation, Observatory, Orbit, Reaction, *Reaction wheel, Satellite, *Scanning, Small, System, Torque, *Torque motor, Wheel.

For abstract, see S 04 20.

N66-35019 Field 17G
CFSTI Prices HC$3.00 MF$0.75
United Aircraft Corp., East Hartford, Conn.
LOW-THRUST GUIDANCE STUDY FINAL REPORT.
by W. R. Fimple, and C. P. Van dine. Jul 66, 76p NASA-CR-77406, E-910350-11
Contract NAS8-20119

Descriptors: Algorithm, Computer, *Computer method, Control, Field, Gravitational, *Gravitational field, Guidance, *Guidance and control, Inverse, Low thrust, *Low thrust propulsion, Method, Navigation, Optimal, *Optimal control, Propulsion, Space vehicle, Square, Trajectory.

For abstract, see S 04 20.

PB-170 733 Field 17G, 9E
CFSTI Prices: HC$3.00 MF$0.75
Airborne Instruments Lab., Deer Park, N. Y.
WAVEGUIDE GLIDE SLOPE ANTENNA TESTS.
Final rept.
by A. D. Mehall. Apr 66, 100p
Contract FA-64WA-5058
Proj. FA-320-101-01N
SRDS-RD-66-29

Descriptors: (*Antennas, *Direction finding), (*Waveguides, Antennas), Flight tests, Antenna radiation patterns.

The report describes development and operation of a null-reference feed system for the directional waveguide glide-slope antenna and the results of pattern measurements performed in the antenna near field. The operation of an aperture-field monitor for the waveguide array is also described. A recommendation is made for the location of a far-field monitor, and flight-test results at both Calverton and Pittsburgh are described. (Author)

PB-170 800 Field 17G
CFSTI Prices: HC$5.00 MF$1.00
Federal Aviation Agency, Washington, D. C. Office of International Aviation Affairs.
INTERNATIONAL AVIATION R AND D SYMPOSIUM AUTOMATION IN AIR TRAFFIC CONTROL (3rd) HELD AT HADDON HALL HOTEL, ATLANTIC CITY, N. J., NOVEMBER 1-3, 1965.
1965, 153p
Rept. on Summary of Discussions and Program Progress Report.

Descriptors: (*Air traffic control systems, Automation), (*Symposia, Air traffic control systems).

PB-170 833 Field 17G
CFSTI Prices: HC$2.00 MF$0.50
Institute of Transportation and Traffic Engineering, Univ. of California, Berkeley.
EVALUATION OF ICAO VISUAL AID PANEL APPROACH LIGHTING PATTERNS.
Final rept.
by D. M. Finch, R. Horonjeff, and H. G. Paula.
Feb 66, 31p
Contract FAA/ARDS-434
Proj. FAA-430-202-01E
SRDS-RD-65-104

Descriptors: (*Approach lights, Tests), Landing aids, Visibility, All-weather aviation.

Nine different patterns for the last 1000 feet of approach lights before runway threshold, including two European and seven U.S. configurations, were evaluated on a reduced scale in the Fog Chamber by tests in daytime and nighttime fog (1200-foot visual range). The tests, consisting of observations by pilots, showed none of the patterns to be clearly outstanding. Two of the patterns judged fairly effective (one from the United Kingdom and one from the U.S.) also exhibited a serious shortcoming. Among the most acceptable of the patterns tested were two modified versions of the current U.S. standard and the one proposed by The Netherlands. (Author)

PB-170 857 **Field 17G, 17I**
CFSTI Prices: HC$2.00 MF$0.50
National Aviation Facilities Experiment Center, Atlantic City, N. J.
APPLICATION OF ATC RADAR BEACON SYSTEM EXPERIMENTATION.
Final rept.
by Donald S. Schlots. Feb 66, 33p
Proj. FAA-150-534-01X
RD-66-7

Descriptors: (*Air traffic control systems, Radar beacons), (*Radar beacons, Air traffic control systems), Simulation, Performance (Engineering), Display systems.

The report describes a simulation conducted to test and refine the operational use of discrete beacon coding (4096) and altitude reporting to be used during transition to the NAS enivironment. The present 64-code employment plan and the 4096-code plan recommendation in Report No. RD-65-83 (Project No. 150-534-02R) were used as a basis for experimentation. These plans were studied in a simulated ATC environment of mixed ground (NAS and non-NAS equipped facilities) and airborne equipment (non-beacon, 64-code transponder, and 4096-code transponder equipped aircraft). A code employment plan is presented in this report that combines a 4096-code plan with the 64-code plan and is characterized by allocation of code blocks to altitude to be flown. (Author)

PB-172 402 **Field 17G, 17B**
CFSTI Prices: HC$3.00 MF$0.75
National Aviation Facilities Experimental Center, Atlantic City, N. J. Text and Evaluation Div.
LABORATORY TESTS OF SMALL LIGHTWEIGHT ALTITUDE TRANSMISSION EQUIPMENT (SLATE).
Final rept.
by George H. Mahnken. May 66, 25p
SRDS-RD-66-36

Descriptors: (*Data transmission systems, Altitude), (*Air traffic control systems, Radar beacons), Airborne, Weight, Transponders, Performance (Engineering).

Identifiers: SLATE.

The performance characteristics of Small Lightweight Altitude Transmission Equipment (SLATE) were determined through laboratory tests. A description of the SLATE components is given, and the test procedures and results are presented. Test results indicated that design changes would be required in order to achieve the desired performance. It was concluded that the production of suitable small lightweight altitude transmission equipment is feasible; and it was recommended that the FAA promote, within the general aviation community, the use of SLATE-type equipments. (Author)

PB-172 926 **Field 17G, 1B**
CFSTI Prices: HC$7.00 MF$1.50
Litton Systems, Inc., Woodland Hills, Calif. Guidance and Control Systems Div.
EVALUATION OF INERTIAL NAVIGATION SYSTEM IN CIVIL AIR TRANSPORT OPERATIONS. VOLUME I. LN-12 INERTIAL NAVIGATION SYSTEM. BOOK II. DATA SHEETS.
Final rept.
by Robert J. Holm. 15 Jun 66, 327p Rept. no. AQ22016E66
Contract FA65WA-1112
SRDS-RD-66-30-1

Descriptors: (*Inertial navigation, Instrumentation), (*Jet transport planes, Inertial navigation), Civil aviation, Flight testing.

The book presents the flight data sheets and in-flight position error plots collected by Pan American World Airways. (Author)

PB-172 927 **Field 17G, 1B**
CFSTI Prices: HC$5.00 MF$1.00
Litton Systems, Inc., Woodland Hills, Calif. Guidance and Control Systems Div.
EVALUATION OF INERTIAL NAVIGATION SYSTEM IN CIVIL AIR TRANSPORT OPERATIONS. VOLUME I. LN-12 INERTIAL NAVIGATION SYSTEM. BOOK I. DISCUSSION AND ANALYSIS.
Final rept.
by Robert J. Holm. 15 Jun 66, 177p Rept. no. AQ22016E66
Contract FA65WA-1112
SRDS-RD-66-30-1

Descriptors: (*Inertial navigation, Instrumentation), (*Jet transport planes, Inertial navigation), Civil aviation, Flight testing, Navigation computers.

A Litton LN-12 Inertial Navigation System, with a Bendix Corporation Inertial Navigation Steering Computer, was flown in a Pan American World Airways DC-8 aircraft for 55 scheduled transatlantic crossings and 32 other short flights, domestic and foreign. Performance data were collected on inertial accuracy, steering behavior, track holding, maintenance, reliability, in-flight operation, position checks and azimuth drift. Eighty percent of the flights exhibited terminal errors of 10 miles or less in either latitude or longitude coordinates. The LN-12 inertial system operated 424 hours in the navigation mode, during 233 hours of which the aircraft was guided by autopilot controlled by inertial steering commands. Two transatlantic flights are examined in detail for doppler comparison in cross track miles to go, ground speed, and drift angle. These flights are also analyzed for comparison with aircraft compass heading, measured track, drift angle, miles to go, track heading, and waypoint misses. Reliability and maintenance factors were not significant during conduct of the program. Prior to commencement of the data flights, two demonstration flights of dual LN-12 inertial systems were performed. (Author)

PB-170 806 **See Field 17I**

PB-170 832 **See Field 17I**

17H. OPTICAL DETECTION

AD-638 754 **Field 17H, 4B**
CFSTI Prices: HC$1.00 MF$0.50
Pacific Missile Range, Point Mugu, Calif.
DESCRIPTION AND APPLICATION OF LASER RADAR AT PACIFIC MISSILE RANGE.
Technical memo.
by J. L. Karney, J. E. Masterson, and W. E. Hoehne. 17 Aug 66, 22p PMR-TM-66-6

Descriptors: (*Lasers, Detection), (*Meteorological instruments, Lasers), (*Range finding, Lasers), Measurement, Meteorological parameters, Meteorological phenomena.

Identifiers: LIDAR.

The prototype device, called the Mark III LIDAR (Light Detection and Ranging) is presently undergoing operational evaluation. A preliminary description of the data and results obtained are given. The LIDAR is a new and unique tool which promises to provide meteorologists and atmospheric physicists a means to accomplish tasks not possible using present equipment. The LIDAR may someday assist the meteorologist in making short-range forecasts by providing slant-range visibility data and quantitative measurements of stratus density and fog thickness. The LIDAR is capable of determining precise ranges to clouds (together with their bases and tops), measuring the height of temperature inversions, and detecting atmospheric phenomena in apparently clear atmospheres. At the present time, the LIDAR data are used in conjunction with observations from other sources to supplement and improve existing weather information. With relatively minor modifications, the LIDAR could significantly augment the present methods of gathering atmospheric data. (Author)

AD-639 177 **Field 17H**
CFSTI Prices: HC$1.00 MF$0.50
Naval Medical Research Lab., New London, Conn.
UNDERWATER VISUAL COMMUNICATION.
Memo rept.
by J. S. Kinney, and Forrest L. Dimmick. 16 Feb 60, 12p MR-60-5
NAVMED-MR005.14-1001.01.11

Descriptors: (*Underwater communication systems, Visual signals), Colors, Absorption, Underwater light, Illumination, Light transmission, Visibility.

A preliminary survey was made of the value of using light in the blue range as a means for underwater communication. A discussion of the many factors involved is presented, as well as five examples of the combination of factors of transmission, emission, and sensitivity for a single layer of Continental Slope sea water of 66-foot depth, two types of illumination source, and sensitivity in daylight and in semi-darkness. There are certain advantages in using light from the blue and blue-green portion of the spectrum. These advantages increase as the absolute amount of blue light emitted by the source is increased, the distance the light must travel through the water is increased, and the lower the general illumination in the water happens to be.

AD-639 348 **Field 17H, 3A**
Not available from CFSTI.
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
A PHOTOELECTRIC FOCUS AND SEEING MONITOR SOLAR TELESCOPES.
Instrumental papers.
by J. M. Beckers. 14 Jun 65, 8p AFCRL-66-509, AFCRL-IP-106
Proj. AF-7649
Task 764906
Availability: Published in Applied Optics v5 n2 p301-4 Feb 1966.

Descriptors: (*Telescopes, *Optical instruments), Sun, Focusing, Monitors.

A solar focus and seeing monitor is described which utilizes the properties of an image of the telescope objective formed after putting a knife edge next to the solar limb. In a very simple way simultaneous measurements are obtained for the telescope focus and for the image motion and blurring produced by the earth's atmosphere. (Author)

N66-25558 **Field 17H**
CFSTI Prices HC$3.00 MF$0.50
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
EXPERIMENTAL MEASUREMENT OF OPTICAL ANGULAR DEVIATION CAUSED BY ATMOSPHERIC TURBULENCE AND REFRACTION.
by J. L. Hayes, and R. L. Kurtz. May 66, 60p
NASA-TN-D-3439

Descriptors: Amplitude, Analysis, Atmospheric, *Atmospheric turbulence, Fluctuation, Frequency, *Laser, Limit, Meteorology, Optical, *Optical path, *Optical tracking, Path, Position, Random, Statistical, *Statistical analysis, System, Tracking, Turbulence.

For abstract, see S 04 14.

N66-35238 **Field 17H**
CFSTI Prices HC$6.00 MF$1.25
Northrop Corp., Palos Verdes Estates, Calif.
ANALYTICAL AND EXPERIMENTAL INVESTIGATIONS INTO PROBLEMS ASSOCIATED WITH GYRO-STABILIZED PLATFORM-MOUNTED OPTICAL SENSING ELEMENTS FINAL SUMMARY REPORT.
by E. H. Kong Jr. and W. H. Schuck. 15 Jul 66, 205p NASA-CR-77502, NORT-65-126
Contract NAS8-20193

Descriptors: *Alignment, Attitude, Control, *Gyro-stabilized, Horizon, Inertial, Navigation, Optical, *Optical sensor, Orbital, Platform, Sensor, Shielding, Stabilization, *Stabilized platform, Star, *Star tracker, Tracker.

For abstract, see S 04 20.

PB-172 440 **Field 17H, 17I**
CFSTI Prices: HC$2.00 MF$0.50
Smithsonian Astrophysical Observatory, Cambridge, Mass.
MEASUREMENTS OF SATELLITE RANGE WITH A RUBY LASER.
Special rept.
by C. G. Lehr, L. A. Maestre, and P. H. Anderson. 13 May 66, 37p SAO-SR-211, 3-66-33
Grant NsG-87-60
Rept. on Research in Space Science.

Descriptors: (*Range finding, OPDAR), (*OPDAR, Satellite tracking systems), (*Satellite tracking systems, OPDAR), Satellites (Artificial), Ruby, Lasers.

Range measurements on the GEOS-I and BE-C satellites were made with an experimental optical radar located at the Smithsonian astrophysical observing station in New Mexico. The radar's transmitter was a pulsed ruby laser. The receiver incorporated a time-interval counter with an accuracy of plus or minus 10 nsec, which gives a resolution of plus or minus 1.5 m. The most distant range measured was 2.6 Mm. The signals returned from the retroreflecting satellites were more than 16 db below the values predicted by the radar-range equation. The measured ranges were compared with values obtained from orbits computed with field-reduced data of the Baker-Nunn observing stations. The measured and computed ranges were consistent to within a few hundreds of meters, the error that might be expected in the field-reduced orbits. (Author)

AD-639 037 **See Field 5I**

17I. RADAR DETECTION

AD-639 295 **Field 17I**
CFSTI Prices: HC$1.60 MF$0.50
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
THE AGREEMENT IN RANGE AND BEARING REPORTS FROM TWO VF RADAR REPEATERS TRACKING THE SAME TARGET SIMULTANEOUSLY WITH THE B-SCOPE.
Memorandum rept.
by N. R. Bartlett, and A. L. Sweet. 20 Feb 47, 13p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-12

Descriptors: (*Radar repeaters, Errors), Radar tracking, Range finding, Direction finding.

The error indices for stationary targets developed in this study agree generally with the error indices cited in the Preliminary Instruction Book for Navy Model VF indicating equipment. Fifty-six percent of the bearing reports from two VF repeaters were in exact agreement for a stationary target, and in no case was the disagreement greater than one degree. With respect to range reports, 19% were in exact agreement, 56% agreed within 20 yards, and all reports agreed within 100 yards. When contacts are moving, these data are not appropriate. For example, for targets with a relative speed of 80 knots, only 39% of the bearing reports were in exact agreement, and only 41% of the range readings agreed within 100 yards. The agreement between two VF reports decreases markedly as the speed of a target is increased. The reliability of a single report of the position of a contact depends then upon the relative motion of that contact with respect to the position of the radar. (Author)

AD-639 296 **Field 17I, 5J**
CFSTI Prices: HC$2.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
CALCULATION OF BEARING AND RANGE ERRORS DUE TO DELAYS IN TRANSMISSION OF RADAR INFORMATION.
by W. R. Garner, R. M. Hanes, and J. D. Reed. 15 Feb 47, 29p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-11

Descriptors: (*Position finding, Errors), (*Direction finding, Errors), Time studies, Radar operators, Radar images, Velocity, Radar targets.

Whenever there are delays in the reporting of information about target positions as determined by the radar positions, there will be errors in the reported positions. These errors are due to the fact that time is required to report and to transmit target-positions and that during that time the target has moved from the position shown on the radar screen. These errors can be quite appreciable with high speed targets, and with long delays in the transmission of information. In order to show the magnitude of these errors, and in order to facilitate the calculation of maximum allowable delays, for any given set of conditions, mathematical formulae are derived for the calculation of errors in range and errors in bearing due to time delays in the transmission of information. These equations show that speed of the target, target course, initial range, and total time delay all affect the magnitude of errors in either bearing or range. Furthermore, these factors all interact to produce a complicated relation between the magnitude of the error and the time delay. (Author)

AD-639 367 **Field 17I, 5H, 9E**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
SIGNAL MARK SIZE AND VISIBILITY OF RADAR SIGNALS ON A PLAN POSITION INDICATOR.
by N. R. Bartlett, and S. B. Williams. 20 Sep 47, 20p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-30

Descriptors: (*Plan position indicators, Radar signals), (*Radar images, Visibility), Man-machine systems, Visual perception.

Preliminary research on the detectability of signal images on a 7BP7 radar screen indicates the extreme importance of the image size. Image size was varied (1) by regarding the radar screen from different distances, (2) by changing the length of the image by widening the azimuth gate, (3) by changing the thickness of the image by switching to different presentation range scales and (4) by moving the signal from the center to the periphery of the screen. Image size variations by such methods can change the strength of the minimum visible signal by at least eight or ten decibels. The data are preliminary, for equipment limitations did not permit variations from a signal pulse length of two microseconds nor reductions in azimuth gate below 12 degrees. Further research on the problem of image size with refined equipment is now in progress. (Author)

AD-639 368 **Field 17I, 9E**
CFSTI Prices: HC$2.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md.
SOME PERCEPTUAL PROBLEMS IN THE USE OF THE VG REMOTE PPI.
Research rept.
by W. R. Garner. 15 Sep 46, 40p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-2

Descriptors: (*Plan position indicators, Effectiveness), Plotting boards, Radar targets, Radar operators, Range finding, Direction finding.

The VG is a radar remote indicator of the plan-position type which uses a 2-mirror system of reflection and projection to obtain a PPI presentation with a diameter of 25 inches. It is the intent of the experiments to study the VG as an instrument for anti-aircraft designation work, and to compare the efficiency of the VG with other standard equipment used for the same purposes. This study has 2 aspects: (1) To what extent can the efficiency of plotting be increased by using an indicator large enough to allow plotting directly on its surface. (2) Are there any advantages or disadvantages to the VG when it is used to obtain range and bearing information about targets for the purpose of locating directors on targets. As a further purpose, an analysis was made of the perceptual problems involved in the use of radar indicators, particularly in regard to the structuring of the perceptual field used to orient the operator in reference to the radar scope. (Author)

AD-639 371 **Field 17I, 9E, 5E**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
THE EFFECT OF CRI BIAS ON VISIBILITY OF TARGETS ON A REMOTE PPI.
Memorandum rept.
by S. B. Williams, and Ellwood King. 10 Dec 46, 14p
Contract N5-ori-166 (01)
SPECDEVCEN-166-1-6

Descriptors: (*Radar targets, Visibility), (*Plan position indicators, Cathode ray tubes), Intensity, Brightness, Background, Visual perception, Detection.

The cathode ray tube of a VD remote PPI indicator has an optimal bias level with respect to target visibility. Every experiment in which CRT bias was varied yielded a curve of visibility with a maximum lying somewhere between the lowest and highest intensity (CRT bias) settings. In all cases maximum visibility was obtained with a moderately bright, light yellow background, that is, with a comparatively low bias, and not with the dark or high bias background frequently employed by trained operators. The exact specification of this optimal level in volts or in units of illumination is not yet possible with existing measuring instruments. However, it can be fairly well defined visually. (Author)

AD-639 374 **Field 17I, 9E**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
NUMBER OF PIP-SCANS AND TARGET-DETECTABILITY ON CERTAIN HIGH PERSISTENCE PPI TUBES.
Memorandum rept.
by S. B. Williams, and R. M. Hanes. 10 Jan 47, 7p
Contract N5-ori-166 (01)
SPECDEVCEN-166-1-7

Descriptors: (*Plan position indicators, Radar scanning), (*Radar images, Brightness), Visibility, Detection, Cathode ray tube screens.

Several experiments are currently in progress concerning factors affecting the detectability of targets appearing on cathode-ray tubes used in radar. Because the tubes being used have phosphors (P7) of relatively long persistence, it would be interesting to know whether there is any accumulative effect of repeated excitations on the brightness of a phosphor when the time between excitations is on the order of the interval between successive scans. Such a build-up effect, if it were large enough, would tend to increase the intensity of a stationary pip and render it more visible. An experimental investigation of this question is reported in this paper. Briefly the results of the experiment indicate a small but significant enhancement of phosphor brightness with repeated excitations. (Author)

AD-639 375 **Field 17I**
CFSTI Prices: HC$1.60 MF$0.50
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
COMPARISON OF MANUAL AND STANDARD METHODS OF TARGET INDICATION.
Memorandum rept.
by J. D. Reed, and N. R. Bartlett. 1 Feb 47, 11p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-9

Descriptors: (*Radar target position simulators, Search radar), Plan position indicators, Range finding, Direction finding, Radar operators.

The experiment compares the efficiency of two methods of target-indication on a simulated search radar: (1) the present method in which the operator estimates range and bearing with the aid of a bearing cursor and range marks, and makes a verbal report; and (2) an experimental method in which the position of each target is indicated by the use of a pointing device in the hands of the operator. The manual method of indication proved equally accurate in indicating bearing, and more than twice as accurate in indicating range as the oral report of estimation. In speed of indication, the experimental method exceeded the present method more than three times. It was further shown that, using manual indication, no change in performance occurs as a result of increasing the number of targets to be indicated from 5 to 30. These findings lead to the conclusion that a system of target indication based upon pointing would give better results in terms of the performance of the operator at the search radar. An incidental result with important practical implications is that large (20 inch) PPI's yielded no better accuracy or time score than smaller (7 inch) PPI's, using the present estimation method of indication. (Author)

AD-639 376 **Field 17I, 5E, 5H**
CFSTI Prices: HC$1.00 MF$0.50
Industrial Engineering Lab., New York Univ., N. Y.
A SURVEY OF THE IMPORTANCE AND USE OF CONTROLS AND DISPLAYS ON RADAR CONSOLE PANELS. (A CONTRIBUTION TO PANEL LAYOUT).
by K. O. William Sandberg, and Harold L. Lipschultz. 1947, 23p
SPECDEVCEN-166-1-17

Descriptors: (*Radar equipment, Control panels), (*Control panels, *Human engineering), Design, Display systems, Frequency.

The criteria of importance and use (frequency and time) seem satisfactory in establishing the order of consideration for the placement of controls and displays on the face of an instrument panel. The criterion of use appears to be more adaptable to yield gradations. The choice of method of evaluation is dependent upon factors in a specific designing situation. Using the SG-1b (Mod. 50) radar as a vehicle for illustration, the pooled results of three methods of analysis indicate the following controls and displays to be of frequent and occasional use and of high and moderate importance and in their approximate order of preference: (1) Controls - range crank, bearing crank (manual), bearing cursor crank, RPM adjustment knob, range step toggle switch, receiver gain knob, receiver tune knob, scale selector knob, IFF toggle switch, IFF gain knob, AJ control switches, sweep expansion knob, (2) Displays - 'A' scope, PPI scope, range counter, relative-true bearing indicator. (Author)

AD-639 383 **Field 17I, 5J**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md. Psychological Lab.
COMPARISON OF THE CENTER-VERSUS-LEADING EDGE OF THE TARGET PIP IN RANGE DETERMINATION BY THE VF REMOTE RADAR INDICATOR.
Memo rept.
by A. L. Sweet, and C. T. Morgan. 10 Jul 47, 15p
Contract N5-ori-166 (01)
SPECDEVCEN-166-1-25

Descriptors: (*Radar images, *Range finding), Radar targets, Performance (Human), Radar operators.

On the 'B' scope of the VF indicator, it is possible to determine the range of ship targets by tracking either on the center or the leading edge of the pip. An investigation was made of differences in operator performance in ranging by the two methods. The center of pip method gave slightly greater agreement between generator input and VF indicator output. In the first experiment, the mean difference between leading edge ranging and generator input was -77 yards; for center of pip ranging, the mean difference was -61 yards. The respective discrepancies in the second experiment were-9 yards and -1 yard. The difference in ranging between the two methods was due to the fact that the use of the leading edge method resulted in larger and more frequent range underestimations than with the center of pip technique. (Author)

N66-24600 **Field 17I**
CFSTI Prices HC$5.00 MF$1.00
Electro-optical Systems, Inc., Pasadena, Calif.
SOLAR REFLECTING BEACON, PHASE I.
by B. E. Kalensher, and D. E. Stewart. 3 Dec 65, 158p NASA-CR-65255, EOS-6976-PHASE I
Contract NAS9-4790

Descriptors: *Apollo project, Beacon, Concept, Design, Detection, Engineering, Feasibility, Landing, Lunar, *Lunar landing, Radar, *Radar beacon, Reflector, Reliability, Solar, *Solar reflector, Tracking.

For abstract, see S 04 13.

N66-25377 **Field 17I**
CFSTI Prices HC$5.00 MF$1.00
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
ATLAS- CENTAUR VI FLIGHT PATH AND ITS DETERMINATION FROM TRACKING DATA.
by L. W. Miller. 15 Apr 66, 169p NASA-CR-74951, JPL-TR-32-911
Contract NAS7-100

Descriptors: Acquisition, *Atlas centaur launch vehicle, Atlas launch vehicle, Booster, Centaur project, Data, *Data reduction, Earth, Earth orbit, Launch vehicle, Orbit, Path, Reduction, Spacecraft, *Spacecraft trajectory, Station, Table, *Tracking, Trajectory.

For abstract, see S 04 13.

N66-26869 **Field 17I**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
ANALYSIS OF THE INTERACTION OF THE SURVEYOR RADAR ALTIMETER DOPPLER VELOCITY SENSOR SYSTEM AND VERNIER THRUST CHAMBER PLUMES.
by A. J. Kelly. 15 Apr 66, 22p NASA-CR-75271, JPL-TM-32-927
Contract NAS7-100

Descriptors: Altimeter, Chamber, Combustion, Doppler effect, Jet, *Jet plume, Plume, Propellant, Radar, *Radar altimeter, Rocket, *Rocket chamber, *Sensor, Solid, *Surveyor, Velocity, Vernier engine.

For abstract, see S 04 14.

PB-170 806 **Field 17I, 4B, 17G**
CFSTI Prices: HC$3.00 MF$0.75
National Aviation Facilities Experimental Center, Atlantic City, N. J. Test and Evaluation Div.
EVALUATION OF THE RVDP CLUTTER DENSITY OUTLINE.
Final rept.
by H. L. McFann. Feb 66, 83p
Proj. 231-001-11X
RD-66-13

Descriptors: (*Data processing systems, Meteorological radar), (*Meteorological radar, Data transmission systems), Video signals, Meteorological parameters, Aeronautics, Radar clutter.

A Weather Outline Contour Generator (WOCG) was designed as a modification to the Radar Video Data Processing equipment to provide radar weather data along with target data. The equipment was evaluated in its ability to provide an indication of the iso-echo (equal reflected power) contours within a weather system so that the location of the cell core and clutter gradient could be estimated. The outlines generated by the device under test were compared to Plan Position Indicator (PPI) weather patterns derived by operating the normal radar channel at various levels of receiver gain. Radar input signals were obtained from a logarithmic radar receiver, operated in conjunction with the Federal Aviation Agency's Air Route Surveillance Radar, Model ARSR-2, and the contours were displayed on a scan-converted PPI. It was concluded that the WOCG was capable of generating operationally useful contours of weather clutter from the ARSR-2 logarithmic video input. The contours were adjustable to density outline clutter by three distinct levels ranging from the weak precipitation areas to cells denser than those referred to as circular polarization punch-through. Identified for further study were investigations to optimize the sensitivity in range function and to digitize the WOCG output for transmission over telephone lines. In addition to system improvements, recommendations were made to install the device in the National Airspace System Engineering Model. Further experimentation was indicated to determine operation of the WOCG with video inputs from radar systems having different operating parameters. (Author)

PB-170 832 **Field 17I, 4B, 17G**
CFSTI Prices: HC$2.00 MF$0.50
Raytheon Co., Waltham, Mass.
ARSR WEATHER SURVEILLANCE RADAR KIT.
Final rept.
by Edward H. R. Paro. Oct 65, 45p
Contract FA-64-WA-5138
Proj. 241-001-01C
SRDS-65-114

Descriptors: (*Meterological radar, Search radar), (*Search radar, Air traffic control systems), Design.

The ARSR Weather Surveillance Radar Kit provides the ARSR-1E radar with weather data covering the identical enroute airway area normally covered by the Air Traffic Surveillance Radar. The weather intelligence is in the form of three

coded iso-amplitude contours thresholded to display weather amplitude gradients. A circular linear polarizer allowing for two separate and orthogonal outputs provides separation of intelligence. Thus, in a severe weather environment the weather clutter enters the separate weather kit channel but does not interfere with the normal removal of weather clutter from the main radar channel. The weather signals are processed independently of the radar MTI and normal receivers, however, the kit has the additional advantage of using many of the component types and circuits of the ARSR. This ensures performance reliability, lessens the stocking of spare parts, and simplifies maintenance and training, thus reducing repair time. The weather kit prototype model, and the resultant techniques developed for utilizing the display and data, will provide the FAA Air Traffic Controller with the ability to route aircraft around or through storm systems in the radar control area. (Author)

PB-170 967 **Field 17I, 17B**
CFSTI Prices: HC$2.60 MF$0.50
Wright Air Development Center, Wright-Patterson AFB, Ohio. Communication and Navigation Lab.
TRANSPONDER SET AN/APX-19 (MINIATURIZED AN/APX-25).
Technical rept.
by R. W. Stanford. Sep 59, 30p
Proj. AF-1981
Task 43420
AD-228 811, WADC-TR-59-449

Descriptors: (*Transponders, Identification systems), Radar equipment, Airborne, Miniature electronic equipment.

Identifiers: AN/APX-19.

The Air Force need for an Identification (IFF) transponder set capable of being installed in all combatant-type aircraft led to the development of the AN/APX-19. Prototype models of the APX-19 fulfilled all applicable specification requirements and the set can be used in the Mark X (SIF) identification system presently used. The APX-19 consumes about one-half the space of the AN/APX-25 now in use, has greater flexibility, better frequency control, higher altitude capability, and is easier to maintain. The APX-19's peak pulse power is 500 watts nominal and its normal receiver sensitivity is -77 dbm. The development history, test results, and conclusions of the AN/APX-19 Research and Development program are summarized. (Author)

AD-639 287 **See Field 5J**

AD-639 288 **See Field 5J**

AD-639 290 **See Field 5H**

AD-639 369 **See Field 5E**

AD-639 384 **See Field 5H**

AD-639 385 **See Field 5J**

AD-639 391 **See Field 5J**

AD-639 394 **See Field 9E**

AD-639 570 **See Field 5A**

PB-169 120 **See Field 1E**

PB-170 628 **See Field 4B**

PB-170 857 **See Field 17G**

PB-172 440 **See Field 17H**

PB-173 073 **See Field 4B**

17J. SEISMIC DETECTION

AD-638 752 **Field 17J**
CFSTI Prices: HC$3.00 MF$0.75
Arctic Inst. of North America, Montreal (Quebec).
AN ANALYSIS OF LONGSHOT DATA FOR THE CANADIAN SEISMIC STATIONS.
Research paper.
by Oliver George Jensen. May 66, 61p RP-37
Grant AF-AFOSR-1022-66, ARPA Order-292-65
Proj. AF-8652
Prepared in cooperation with British Columbia Univ., Vancouver, Inst. of Earth Sciences, Scientific-13.

Descriptors: (*Nuclear explosions, Detection), (*Seismic waves, Experimental data), Canada, Underground explosions, Simulation, Seismological stations, Analysis.

Identifiers: Long shot.

A pilot analysis of the Long Shot nuclear explosion data received by the Canadian seismic stations indicates a consistent compressional first arrival as expected from an impulsive explosion source. Significant travel time discrepancies are observed in the commencement of the P arrival which arrived up to 6 seconds early at all stations with the largest residuals at the most distant sites. A comparison earthquake in the Rat Islands area indicates a similar bias trend. The P arrival amplitudes appear to be anomalously low in the central B.C. area and high in eastern Canada. The effect is also evident in the magnitude determinations which are based on these amplitudes. The causes of the variations of magnitudes and the anomalously low amplitudes have not been explained. The average magnitude and standard deviation for all Canadian stations is shown to be 6.01 plus or minus 0.40 which agrees well with the world wide average determination of 5.99 plus or minus 0.52. Spectral investigations demonstrate that there are both common and individual characteristics among the ground amplitude spectra of the different stations. These characteristics have not been correlated to the explosion source mechanism or to geological structure although some causative suggestions have been made. (Author)

AD-639 197 **See Field 8K**

18B. ISOTOPES

N66-25817 **Field 18B**
CFSTI Prices HC$1.00 MF$0.50
Osterreichische Studiengesellschaft Fur Atomenergie G.m.b.h., Seibersdorf (Austria).
SEPARATION OF STABLE ISOTOPES OF RARE EARTHS.
Die Separation Von Stabilen Isotopen Der Seltenen Erden
by E. Formann, G. Lugmair, F. Rudenauer, F. P. Viehbock, and H. Wotke. 1965, 21p SGAE-PH-32/1965
In German Submitted For Publication

Descriptors: Earth, Erbium, Field, Gadolinium, Ion, *Isotope, Magnetic, Rare, *Rare earth, Sector, *Separation, Stability, Ytterbium.

For abstract, see S 04 14.

AD-639 047 **See Field 3B**

AD-639 261 **See Field 20L**

18C. NUCLEAR EXPLOSIONS

AD-639 600 **Field 18C**
CFSTI Prices: HC$1.00 MF$0.50
RAND Corp., Santa Monica, Calif.
THE DEVELOPMENT OF A RADIO SIGNAL FROM A NUCLEAR EXPLOSION IN THE ATMOSPHERE.
by Victor Gilinsky. Aug 66, 25p RM-4988

Descriptors: (*Nuclear explosions, *Radio signals), Airburst, Electromagnetic waves, Numerical analysis, Partial differential equations, Atmosphere, Electromagnetic fields, Explosion effects.

The dipole radio signal from a low altitude atmospheric nuclear explosion of low yield is computed by numerically integrating Maxwell's equations. The source is described by a simple model. The function describing the time history of the rate of gamma output is taken to be an isosceles triangle with a base equal to a fraction of a microsecond. The asymmetry necessary for radiation comes entirely from the variation of air density with altitude. The dipole fields are shown as functions of position for various times after the explosion. These curves form, in effect, a motion picture of the development of the signal. (Author)

PB-170 908 **Field 18C, 6R**
CFSTI Prices: HC$6.60 MF$0.75
Public Health Service, Washington, D. C. Div. of Radiological Health.
1962 PACIFIC NUCLEAR TESTS (OPERATION DOMINIC) OFF-SITE SURVEILLANCE PROGRAM. PART I. ACCOUNT AND DESCRIPTION OF PUBLIC HEALTH SERVICE SUPPORT ACTIVITIES.
Rept. for Mar 62-Nov 62.
Nov 62, 62p

Descriptors: (*Nuclear explosions, Test facilities), (*Public health, *Health physics), Pacific Ocean islands, Nuclear weapons, Tests, Radiation hazards, Radiation monitors.

Identifiers: Dominic operation.

The Public Health Service of the Department of Health Education and Welfare (PHS) agreed to provide assistance to JTF-8 in planning, staffing and assisting in the operation of a radiological safety program for inhabited areas within a 2000 mile radius of the Pacific test sites. The 1962 nuclear weapons tests known as Operation DOMINIC, during which PHS assistance was provided, was carried out in two phases: Phase I included those events which occurred in the vicinity of Christmas Island from late April to early July; Phase II covered those events originating from Johnston Island from early July through November 1962. Part I contains maps of the test zone in the Pacific, Christmas Island and Johnston Island; accounts of Phase I and Phase II Operations, list of events, description of monitoring stations, tables of external gamma radiation levels recorded by RM-5 background recorders and AN/PDR-27J instruments, a summary of gross beta activity in air by months, data on sampling of water and precipitation of foods, and an account of special air missions. (Author)

PB-170 909 **Field 18C, 6R**
CFSTI Prices: HC$15.50 MF$1.00
Public Health Service, Washington, D. C. Div. of Radiological Health.
1962 PACIFIC NUCLEAR TESTS (OPERATION DOMINIC) OFF-SITE SURVEILLANCE PROGRAM. PART II. MONITORING TECHNIQUES, LABORATORY PROCEDURES AND REPORT OF FINDINGS.
Rept. for Mar 62-Nov 62.
Nov 62, 159p
See also PB-170 908.

Descriptors: (*Nuclear explosions, Test facilities), (*Health physics, Nuclear explosions), Health physics instrumentation, Pacific Ocean islands, Nuclear weapons, Tests, Public health.

Identifiers: Dominic operation.

Monitoring techniques were selected to provide a capability of determining the radiological situation at any time and to continuously document all levels that might lead to a radiation exposure. In this regard, equipment to measure external gamma

radiation levels from background to emergency levels was provided as well as continuous sampling apparatus. Docmentary instrumentation consisted of film badges, continuous recorders, air samplers, and composite precipitation collectors. Food, soil, and vegetation sampling provided further information of a documentary nature. (Author)

PB-170 910 **Field 18C, 6R**
CFSTI Prices: HC$7.60 MF$0.75
Public Health Service, Washington, D. C. Div. of Radiological Health.
1962 PACIFIC NUCLEAR TESTS (OPERATION DOMINIC) OFF-SITE SURVEILLANCE PROGRAM. PART III. RADIATION SURVEILLANCE NETWORK STATE OF HAWAII.
Rept. for Mar 62-Nov 62.
Nov 62, 72p
See also PB-170 909.

Descriptors: (*Nuclear explosions, Test facilities), (*Health physics, Nuclear explosions), Radioactive fallout, Sampling, Data, Pacific Ocean islands, Nuclear weapon tests.

Identifiers: Dominic operation.

Contains the radioactive fallout data collected by the Public Health Radiation Surveillance Network in cooperation with the Hawaii State Department of Health.

AD-639 446 **See Field 18H**

18D. NUCLEAR INSTRUMENTATION

AD-638 725 **Field 18D, 12A**
CFSTI Prices: HC$3.00 MF$0.75
Naval Ordnance Lab., White Oak, Md.
A MONTE CARLO CALCULATION TO SIMULATE DETECTOR RESPONSE TO UNDERWATER GAMMA RAYS.
by Susan W. Madigosky, and Donald G. Simons.
14 Jul 66, 70p NOLTR-66-140
Contract AT (49-7)-2430
Proj. FR-43
Task NOL-753/AEC

Descriptors: (*Monte Carlo method, *Gamma counters), (*Gamma rays, Underwater), Simulation, Programming (Computers).

The response function of a scintillation detector surrounded by a monoenergetic gamma-ray source which is uniformly dispersed in an infinite volume of water has been calculated. The method of calculation is that of random sampling (Monte Carlo) and is programmed for the IBM 7090 computer. Rather than starting the sampling by taking gamma-ray sources at random throughout the volume of water the response is determined for a weighted set of secondary gamma-ray sources taken to be on the surface of the detector system. The spectrum of secondary energies chosen is taken to be the equilibrium flux distribution which is obtained in an infinite volume of water in which there is no detector. The detector response is determined by a superposition of the weighted secondary sources. Detector response has been obtained for gamma-ray sources from Cr51, Cs137, K40, Na24, and Ce144. The calculated response for these sources agrees quite well with the measured response in shape but not in magnitude. Here, it is found that the artificial spectra have an amplitude which is approximately 1.6 times the measured spectra. This difference appears to be mainly due to two sources: the difference in geometry between the actual spectrometer and the 'spectrometer' used for the calculation and the approximation in which the distribution of secondary source neglects the presence of the detector. (Author)

AD-639 587 **Field 18D, 9E**
CFSTI Prices: HC$1.00 MF$0.50
Army Electronics Command, Fort Monmouth, N. J.
SOLID-STATE ELECTROMETER FOR PORTABLE RADIATION MONITOR.
Technical rept.
by Joseph C. Nirschl. Aug 66, 23p ECOM-2736
Proj. DA-1P6-20901-A-198
Task 1P6-20901-A-198-06

Descriptors: (*Radiation monitors, *Electrometers), (*Semiconductor devices, Electrometers), Transistors, Circuits, Radiation measurement systems, Portable, Performance (Engineering).

A solid-state electrometer is described in which a Metal-Oxide Semiconductor Field Effect Transistor (MOS FET) is employed in the high impedance input stage. The range of current measurement is from 10 to the -12th power Amperes to 10 to the -8th power Amperes. The design of this electrometer lends itself to application in a portable radiation survey meter, affording high linearity, fast response, instant warm-up, and low power consumption. (Author)

N66-25389 **Field 18D**
CFSTI Prices HC$1.00 MF$0.50
Central Lab. For Radiological Protection, Warsaw (Poland).
ALPHA CONTAMINATION LOCATOR WITH JUNCTION RADIATION DETECTOR.
Przyrzad Z Polprzewodnikowym Detektorem Promieniowania Do Lokalizacji Skazen Alfa
by B. Bukowiecki. 1965, 12p CLOR-39/D

Descriptors: *Acoustics, Alpha, *Alpha radiation, Circuit, Contamination, Detector, Diode, Electronic, Germanium, Particle, Radiation, *Radiation detector, Signal, Transistor.

For abstract, see S 04 14.

N66-25390 **Field 18D**
CFSTI Prices HC$2.00 MF$0.50
Osterreichische Studiengesellschaft Fur Atomenergie G.m.b.h., Seibersdorf (Austria).
APPLICATION OF RADIOACTIVE TRACER TECHNOLOGY IN HIGH VACUUM IN THE CONSTRUCTION OF A MASS SEPARATOR-COLLECTOR FOR XENON.
Anwendung Der Radioaktiven Tracertechnik Im Hochvakuum Zur Konstruktion Eines Massenseapratorkollektors
Fur Xenon
by R. Dobrozemsky, E. Hechtl, and F. P. Viehbock. 1965, 26p SGAE-PH-31/1965
In German Submitted For Publication

Descriptors: *Collector, Electromagnetic, *Electromagnetic method, High vacuum, Isotherm, Isotope, Measurement, Method, Purity, Radioactivity, Separator, Tracer, *Xenon 133.

For abstract, see S 04 14.

N66-25429 **Field 18D**
CFSTI Prices HC$2.00 MF$0.50
Comitato Nazionale Per L Energia Nucleare, Frascati (Italy).
A DEVICE FOR THE FOCUSING AND MAGNETIC ANALYSIS OF CHARGED PIONS PHOTOPRODUCED BY THE FRASCATI ELECTROSYNCHROTRON. PART III - CONTROL OF THE OPTICAL PROPERTIES OF THE MAGNETS BY MEANS OF A HODOSCOPE WIRE.
Un Dispositivo Per La Focalizzazione E L'analisi Magnetica Di Pioni Carichi Fotoprodotti Dall'elettrosincrotrone Di Frascati, Parte Iii-Controllo Delle Proprieta Ottiche Dei Magneti Mediante Un Odoscopio A Filo
by G. Sanna. 20 Dec 65, 46p LNF-65/48
In Italian Its Nota Interna No.-300

Descriptors: Analysis, Charge, *Charged particle, Cosmic, *Electromagnet, Electron, Focusing, Graph, *Hodograph, Magnetic field, Model, Optical, Particle, Photoproduction, Pion, Property, *Quadrupole lens, Synchrotron, Wire.

For abstract, see S 04 14.

PB-170 651 **Field 18D, 18I**
CFSTI Prices: HC$5.60 MF$0.50
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
ETUDE ET REALISATION D'UN SPECTROMETRE BETA MULTIVOIES A CHAMP MAGNETIQUE UNIFORME (Theoretical Study and Construction of a Multichannel Beta Spectrometer with Uniform Magnetic Field).
Doctoral thesis.
by Francois Schussler. 1966, 56p CEA-R-2950
Text in French; attached summary in English.

Descriptors: (*Nuclear radiation spectrometers, Design), (*Beta-ray spectroscopy, Instrumentation), (*Decay schemes, Beta-ray spectrum), Magnetic fields, Beta decay, Gamma emission, Radioactive isotopes, Samarium, Sodium, Electromagnetic lenses, Resolution, Calibration, France.

After a brief survey of the interest of a multichannel beta spectrometer for studying decay schemes of short lived nuclides (30 seconds minimum), the theoretically well known characteristics of uniform magnetic field analyser--image of a large source--transmission and resolution--are briefly reviewed. The apparatus built as a result of these calculations is described. This apparatus allows the determination of beta spectra by simultaneous determination of the beta spectra in coincidence with four gamma rays predetermined in the gamma spectrum of the studied nuclide. The experimental characteristics of the spectrometer--calibration in energy and transmission--and the first measurement of beta spectra Sm155 and of coincidences Na24, are given. (Author)

AD-638 776 **See Field 20G**

AD-638 955 **See Field 20H**

N66-35143 **See Field 14B**

18E. NUCLEAR POWER PLANTS

AD-638 891 **See Field 5I**

18F. RADIATION SHIELDING AND PROTECTION

N66-24415 **Field 18F**
CFSTI Prices HC$2.00 MF$0.50
Institut Franco-allemand De Recherches, St. Louis (France).
PROPOSAL TO AMELIORATE THE RADIOACTIVE PREPARATIONS USED IN SPARK GAPS.
Vorschlag Zur Verbesserung Der Radiumraparate In Den Funkenstrecken
by F. Daublin. 5 Sep 63, 38p T-19/63
In German

Descriptors: Absorption, Aluminum, Contamination, Foil, Gap, Human, Laboratory, *Radiation absorption, *Radioactive contamination, Radioactivity, Radium, Regulation, Safety, *Shielding, Source, Spark, *Spark gap.

For abstract, see S 04 13.

N66-26815 **Field 18F**
CFSTI Prices HC$3.00 MF$0.75
Oak Ridge National Lab., Tenn.
BIBLIOGRAPHY, SUBJECT INDEX, AND AUTHOR INDEX OF THE LITERATURE EXAMINED BY THE RADIATION SHIELDING INFORMATION CENTER - SPACE AND ACCELERATOR SHIELDING.
by J. Gurney. Nov 65, 74p NASA-CR-75316, ORNL-RSIC-11

Contract NASA ORDER R-104, W-7405-ENG-26

Descriptors: Author, *Bibliography, Cross section, Data, Index, Particle, Radiation, *Radiation shielding, Scattering, *Scattering cross section, Shielding, Source, Space, *Space radiation, Subject, Transport.

For abstract, see S 04 14.

N66-26821 **Field 18F**
CFSTI Prices HC$2.00 MF$0.50
Lockheed-Georgia Co., Dawsonville.
HOT CELL RADIATION TESTING AND INSPECTION.
1965, 28p NASA-CR-75302
Contract NAS8-5332

Descriptors: Cell, Cobalt 60, Complex, Facility, Hot, Inspection, Leakage, Radiation, *Radiation shielding, Shielding, Test, *Test facility, Testing.

For abstract, see S 04 14.

AD-639 610 **See Field 9A**

18G. RADIOACTIVE WASTES

N66-35044 **Field 18G, 18J**
CFSTI Prices HC$2.00 MF$0.50
Osterreichische Studiengesellschaft Fur Atomenergie G.m.b.h., Seibersdorf (Austria).
INVESTIGATION OF THE FISSION PRODUCT DISTRIBUTION IN THE COATING OF FUEL PARTICLES FOR HIGH TEMPERATURE REACTORS.
Untersuchung Ueber Die Spaltproduktverteilung In Der Beschichtung Von Brennstoffteilchen Fuer Hochtemperaturreaktoren
by H. Bildstein, and L. Szterk. May 66, 33p
SGAE-CH-33/1966
In German, English Summary Submitted For Publication

Descriptors: Cerium, Cesium, *Coating, Distribution, Element, Fission, *Fission product, Fuel, *Fuel element, Gamma, High temperature, Nuclide, Particle, Product, Radiation, Reactor, Rubidium, *Spectrometry, Zirconium.

For abstract, see S 04 20.

PB-172 957 **Field 18G**
CFSTI Prices: HC$2.00 MF$0.50
Public Health Service, Washington, D. C. Div. of Radiological Health.
SOIL AND SEDIMENT ANALYSIS: PREPARATION OF SAMPLES FOR ENVIRONMENTAL RADIATION SURVEILLANCE. PART I. PREPARATION OF SOIL SAMPLES: LABORATORY TECHNIQUES. PART II. ULTRASONIC DISPERSION OF SEDIMENTS FOR SIZE FRACTION RADIOANALYSIS.
Environmental health series.
by John H. Abrahams Jr, and Raymond H. Johnson Jr. Jun 66, 33p PHS-999-RH-19

Descriptors: (*Radiological contamination, Soils), (*Soils, Radiological contamination), Sedimentation, Material separation, Ultrasonic radiation, Radioactive waste, Radiation monitors.

For surveillance studies, comparison of activity levels in soil and sediment samples is usually difficult, particularly for 'grab' samples, because of the wide variability in composition of both soil and sediment samples. Thus, radioactivity levels of sediment samples, for example, are likely to be a function of sample composition rather than of the amount of radioactivity present in the ambient water. For this reason, care at each step of the procedure--sample collection, preparation, and analysis--is vital for quantifying the radionuclide content of geologic and hydrologic materials. These studies were conducted to determine whether some active portion of a 'grab' sample, easily separated from the inert part of the sample, would provide a sensitive and reproducible indicator of radiocontamination in the environment. Although the experimental material for these studies consisted of soil and sediments from eastern Massachusetts, it is believed that, when standardized, the method will provide a useful and sensitive indicator for monitoring bottom sediments in general. (Author)

18H. RADIOACTIVITY

AD-638 848 **Field 18H, 8J, 18J**
CFSTI Prices: HC$2.00 MF$0.50
Naval Radiological Defense Lab., San Francisco, Calif.
RADIOACTIVITY RELEASE FROM RADIONUCLIDE POWER SOURCES. III. RELEASE FROM PLUTONIUM METAL TO SEAWATER.
by Ming G. Lai, and Harry Goya. 27 Sep 66, 49p USNRDL-TR-1050
Research supported in part by Atomic Energy Commission. Contract AT (4905)-2084. See also AD-637 517.

Descriptors: (*Sea water, Radiological contamination), (*Reactor fuels, Radioactivity), (*Plutonium, Chemical reactions), Test methods, Hydrogen, Plutonium compounds, Solids, Ions, Plutonium alloys, Solutions, Reaction kinetics.

Plutonium metal reacts completely with natural seawater to produce solid reaction products, believed to be plutonium oxide and/or hydroxide, and a gaseous product whose major component is hydrogen. The mole ratio of plutonium metal reacted to hydrogen evolved is unity. The mixture resulting from the reaction of plutonium metal with seawater contains a non-uniform distribution of solids, and ionic and complexed species. In order to reproducibly sample this heterogeneous mixture an experimentally determined sampling procedure must be followed which produces uniform results. The maximum rate at which plutonium solid reaction products enter into 'solution' in seawater is very slow, approximately 1.5 to 2 microgram per day per 50-70 mg of solids in seawater. The effect of individual complexing anions on the solubility of the Pu solids was found to be additive. The equilibrium (or maximum) concentration of dissolved Pu in three samples of natural seawater was found to be 67 microgram/l. For seawater samples taken at different localities or at different times of the year, deviations from this value can be expected due to differences in the concentrations of complexing anions present. (Author)

AD-638 862 **Field 18H, 9A**
CFSTI Prices: HC$3.00 MF$0.75
Hughes Aircraft Co., Fullerton, Calif. Ground Systems Group.
TRANSISTOR QUALITY STATISTICS IN A PULSED IONIZING RADIATION ENVIRONMENT - t sub sR.
Final rept.
by K. R. Walker. Sep 66, 84p FR-66-17-158
Contract N228 (62479)69539
Proj. SR-007-11-01
Task 0551
USNRDL-TRC-58

Descriptors: (*Transistors, *Radiation damage), Statistical analysis, Nomographs, Mathematical prediction.

A statistical study was performed to establish prediction probability levels for the Hughes radiation-induced storage time (t sub sR) prediction technique as applied to worst-case circuit design and transistor quality control. One hundred ten (110) each of five (5) transistor types were employed in the study. The study shows that it is feasible to use this prediction technique to estimate the mean and upper spread limits of open-base radiation storage time, t sub sR*, for individual device types. Hence, the technique can be employed in worst-case design procedures, in quality control and in device type selection. A procedure is given for predicting a t sub sR* distribution, for a large transistor batch, from the measured high-current electrical storage time (t sub s) distribution and statistical parameters obtained from small sample (e.g., 10 - 15 units) radiation measurements. According to standard statistical tests, the distribution predictions exhibit high confidence (90 - 95%) for radiation rates significantly greater than that required for marginal saturation. Additionally, a nomograph prediction method is presented which provides estimates of t sub sR* means and spread limits based completely upon electrical measurements. (Author)

AD-639 446 **Field 18H, 18C, 15F**
CFSTI Prices: HC$3.00 MF$0.50
Naval Radiological Defense Lab., San Francisco, Calif.
A PREDICTION SYSTEM FOR THE NEUTRON-INDUCED ACTIVITY CONTRIBUTION TO FALLOUT EXPOSURE RATES.
by Thomas H. Jones. 12 Aug 66, 55p USNRDL-TR-1056

Descriptors: (*Radioactive fallout, *Neutron activation), Dose rate, Nuclear explosions, Thermal neutrons, Soils, Neutron capture, Neutron cross sections, Monte Carlo method, Neutron spectrum, Mathematical prediction, Programming (Computers).

A system was devised to predict the neutron-induced activity contribution to fallout exposure rates. The system uses the simplifying assumptions of (1) a semi-empirical formula to determine the soil capture fraction and (2) thermal neutron cross sections to represent weapon-neutron cross sections. Results, using these assumptions, agree with those of another complete system for predicting the neutron-induced activity contribution to fallout exposure rates. In addition, results from various portions of the system agree with results obtained by more complicated methods. (Author)

AD-639 482 **Field 18H, 11G**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
DIELECTRIC LOSSES SITUATED IN AN IONIZING RADIATION FIELD.
by V. K. Zhuravlev. 6 Jun 66, 13p FTD-TT-65-398
TT-66-62345
Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR), n5 p86-90 1964.

Descriptors: (*Dielectrics, *Radiation damage), Dielectric properties, Polarization, Relaxation time, USSR.

The article discusses the relaxation polarization at the effect of ionizing radiation of low intensity, when the irreversible changes in the dielectric can be disregarded. It is shown, that the appearance of 'hot' molecules on account of radiation energy absorption, may lead to acceleration as well as to slow down of dielectric relaxations, and also to an increase or decrease of dielectric losses. (Author)

N66-24316 **Field 18H**
CFSTI Prices HC$3.00 MF$0.50
Laboratoires Du Centre D Etude De L Energie Nucleaire, Mol (Belgium).
MIGRATION OF RADIO ELEMENTS IN SOIL FINAL REPORT.
Migration De Radio-elements Dans Le Sol Rapport Final
by L. Baetsle, W. F. Maes, J. Souffriau, and P. I. Staner. 1966, 66p EUR-2481-F
Contract EURATOM-002-63-10 WASB
In French, English Summary

Descriptors: Barrier, Chemical, Diffusion, Dispersion, Ground, *Hydrology, Infiltration,

Isotope, Measurement, *Meteorology, *Migration, Molecular, *Radioactive isotope, Radioactivity, *Soil, Strontium, Strontium 90, Velocity, Water.

For abstract, see S 04 13.

N66-24901 **Field 18H**
CFSTI Prices HC$1.00 MF$0.50
Polish Academy Of Sciences, Warsaw.
GAMMA RAYS FROM INELASTIC SCATTERING OF 14.1 ME V NEUTRONS ON C12 AND O16.
Promieniowanie Gamma Z Nieelastycznego Rozpraszania Neutronow 14,1 Meu Na Jadrach C12 I O16
by T. Kozlowski, W. Kusch, and J. Wojtkowska. Apr 65, 11p INR-661/IA/PL

Descriptors: *Carbon, Cross, Differential, Gamma, *Gamma radiation, *Inelastic scattering, Inelasticity, Measurement, Neutron, *Neutron scattering, *Oxygen, Radiation, Scattering, Section.

For abstract, see S 04 13.

N66-25478 **Field 18H**
CFSTI Prices HC$2.00 MF$0.50
Technisch Documentatie En Informatie Centrum Voor De Krijgsmacht, The Hague (Netherlands).
H.E.R.O. (HAZARDS ELECTRO MAGNETIC RADIATION TO ORDNANCE) BIBLIOGRAPHY.
by W. G. Van voss. 15 Jan 66, 45p TDCK-43958

Descriptors: Abstract, Annotation, *Bibliography, Device, Electromagnetic, *Electromagnetic radiation, Explosive, *Explosive device, *Hazard, *Hero reactor, Ignition, Ordnance, Radiation.

For abstract, see S 04 14.

N66-25825 **Field 18H**
CFSTI Prices HC$1.00 MF$0.50
India. Dept. Of Atomic Energy, Bombay.
SOME ASPECTS OF FALLOUT FROM THE FIRST AND SECOND CHINESE TESTS.
by K. G. Vohra. 1965, 19p AEET-240

Descriptors: Airborne, *China, Cloud, Debris, Explosion, *Fallout, Fission, *Fission product, India, Isotope, Neptunium, Nuclear, *Nuclear explosion, Product, *Radioactive debris, Radioactivity, *Uranium 235, Wind.

For abstract, see S 04 14.

PB-170 657 **Field 18H**
CFSTI Prices: HC$3.60 MF$0.50
Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
LES RETOMBEES RADIOACTIVES EN FRANCE APRES LA SECONDE EXPLOSION NUCLEAIRE CHINOISE PROCESSUS DE TRANSFERTS ATMOSPHERIQUES (Radio-Active Fall-Out in France after the Second Chinese Nuclear Explosion - Atmospheric Transfer Processes).
by Andre Doury, and Pierre Bourgeon. 1966, 33p CEA-R-3020
Text in French; attached summary in English.

Descriptors: (*Radioactive fallout, France), (*Meteorological parameters, Radioactive fallout), Atmospheric motion, Nuclear explosions, China, Fission products.

The products liberated into the atmosphere by the second Chinese nuclear explosion were detected and measured in France during the months of May, June, and July 1965. The main results are presented and discussed. They are considered in particular in the light of the meteorological conditions as a function of the most recent hypotheses concerning transfer processes. (Author)

N66-24451 **See Field 11F**

N66-24872 **See Field 11C**

N66-25471 **See Field 6R**

PB-170 651 **See Field 18D**

18I. REACTOR ENGINEERING AND OPERATION

N66-26822 **Field 18I**
CFSTI Prices HC$3.00 MF$0.50
Westinghouse Electric Corp., Pittsburgh, Pa.
EXPERIMENT DESIGN MANUAL AND HAZARDS ANALYSIS - PLUM BROOK REACTOR FACILITY.
May 64, 52p NASA-CR-75303, WANL-TNR-119, REV. 1

Descriptors: Actuation, Analysis, Capsule, Cooling, Design, Environment, Facility, Hazard, Instrument, *Manual, *Plum brook reactor, Radiation, *Radiation hazard, Reactor, *Reactor safety, Safety, Test, *Test facility, Tube, Water.

For abstract, see S 04 14.

N66-35276 **Field 18I**
CFSTI Prices HC$1.00 MF$0.50
United Kingdom Atomic Energy Authority, Harwell (England).
THE WETTING OF HOT SURFACES BY WATER IN A STEAM ENVIRONMENT AT HIGH PRESSURE.
by A. W. Bennett, G. F. Hewitt, H. A. Kearsey, and R. K. Keeys. May 66, 26p AERE-R-5146

Descriptors: Environment, Film, High pressure, Hot surface, Rate, Stainless, *Stainless steel, Steam, Steel, *Tube, Vertical, Water, *Wetting.

For abstract, see S 04 20.

18J. REACTOR MATERIALS

N66-24412 **Field 18J, 11F**
CFSTI Prices HC$3.00 MF$0.50
Aktiebolaget Atomenergi, Stockholm (Sweden).
SWEDISH WORK ON BRITTLE-FRACTURE PROBLEMS IN NUCLEAR REACTOR PRESSURE VESSELS.
by M. Grounes. Mar 66, 54p AE-221

Descriptors: Austenite, *Brittleness, Crack, *Fracture, High strength, *High strength steel, Irradiation, Martensite, Material, *Materials testing reactor, Pressure, *Pressure vessel, Propagation, Reactor, Steel, Temperature, Testing, Transition, Vessel.

For abstract, see S 04 13.

N66-24885 **Field 18J**
CFSTI Prices HC$2.00 MF$0.50
European Atomic Energy Community, Brussels (Belgium).
TRAPPING OF KRYTON IN URANIUM CARBIDE SURFACES.
by O. Gautsch, and C. Mustacchi. Mar 66, 26p EUR-2749.E

Descriptors: Atom, Calcium, Carbide, Concentration, Evaporation, Fission, Fluoride, Gas, Gold, Irradiation, *Krypton, Krypton-85, Neutron, *Neutron irradiation, Particle, Pressure, Rare, *Rare gas, Saturation, Surface, Thermal, *Trapped particle, Trapping, Uranium, *Uranium carbide.

For abstract, see S 04 13.

N66-24931 **Field 18J**
CFSTI Prices HC$1.00 MF$0.50
Atomics International, Canoga Park, Calif.
TUNGSTEN RESONANCE INTEGRALS AND DOPPLER COEFFICIENTS THIRD QUARTERLY REPORT, JAN. - MAR. 1966.
by S. G. Carpenter, L. B. Levitt, J. M. Otter, R. K. Paschall, and H. N. Royden. 13 May 66, 20p NASA-CR-54954, AI-66-85
Contract NAS3-7982

Descriptors: Calibration, Coefficient, Cross section, *Doppler effect, Flux, Gold, Integral, *Isotope, Reactivity, Reactor, *Resonance, Spectrum, *Tungsten.

For abstract, see S 04 13.

N66-24970 **Field 18J**
CFSTI Prices HC$1.00 MF$0.50
General Dynamics Corp., San Diego, Calif.
TUNGSTEN CLADDING OF URANIUM-ZIRCONIUM CARBIDES BY VAPOR DEPOSITION.
by J. R. Lindgren. 8 Mar 63, 21p NASA-CR-74685, GAMD-4220
Contract NAS3-2532

Descriptors: Carbide, *Cladding, Coating, Deposition, *Tungsten, Uranium, *Uranium carbide, Vapor, *Vapor deposition, Zirconium, *Zirconium carbide.

For abstract, see S 04 13.

N66-35030 **Field 18J**
CFSTI Prices HC$2.00 MF$0.50
Osterreichische Studiengesellschaft Fur Atomenergie G.m.b.h., Seibersdorf (Austria).
FABRICATION METHODS AND EVALUATION OF URANIUM-THORIUM-CARBIDE FUEL FOR HIGH TEMPERATURE GAS COOLED REACTORS.
by H. Bildstein, and P. Koss. 1966, 34p M-5/1966, SGAE-CH-35/1966
Presented At 2d Intern. Thorium Fuel Cycle Symp., Gatlinburg, Tenn., 3-6 May 1966

Descriptors: Carbide, Compound, Cooling, Dissolution, Element, Fabrication, Fuel, Gas, *Gas cooled reactor (gcr), High temperature, Method, Particle, Reactor, *Reactor fuel, Thorium, *Thorium compound, Uranium, *Uranium carbide.

For abstract, see S 04 20.

N66-35219 **Field 18J**
CFSTI Prices HC$3.00 MF$1.00
Westinghouse Electric Corp., Pittsburgh, Pa.
IRRADIATION OF REFRACTORY FUEL COMPOUNDS, U02 AND UC, AT HIGH SPECIFIC POWER TO HIGH BURNUPS - POST-IRRADIATION EXAMINATION OF CAPSULE 1.
by R. E. Schreiber. 1 Aug 66, 118p NASA-CR-72019, WCAP-2972
Contract NAS3-3392

Descriptors: Carbide, Compound, Density, Dioxide, Element, Fission, Fuel, Gas, *Irradiation, Material, Melting, Metallography, Reactor, *Reactor fuel, Refractory, *Refractory material, Release, Uranium, *Uranium compound.

For abstract, see S 04 20.

PB-170 645 **Field 18J, 11B**
CFSTI Prices: HC$5.60 MF$0.75
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
INFLUENCE DE L'OXYGENE, DE L'AZOTE ET DU CARBONE SUR LE PARAMETRE RETICULAIRE DU MONOCARBURE D'URANIUM (Influence of Oxygen, Nitrogen and Carbon on the Lattice Parameter of Uranium Mono-Carbide).
by Pierre Magnier. Apr 66, 59p CEA-R-2852
Text in French; Attached Summary in English.

Descriptors: (*Uranium compounds, Phase studies), (*Reactor materials, Phase studies), Solid solutions, Uranium alloys, Oxygen, Nitrogen, Carbon, Carbides, Grain structures (Metallurgy), Crystal lattices, Solubility, France.

Identifiers: Uranium carbides.

A study was made of the influence of oxygen and nitrogen contents on the lattice parameter of U (C,O,N) solid solutions around UC composition. The data permit a determination of the solubility of oxygen in UC: a U (C1-xOx) solid solution exist if x is smaller than 0.37. A study was also made of the influence of carbon content on the lattice parameter of U-UC solid solutions around UC. This study permits the determination of the solubility of U in UC at the different temperatures. Consequences upon uranium-carbon diagram are envisaged. (Author)

PB-170 652 **Field 18J, 11B**
CFSTI Prices: HC$6.60 MF$0.75
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
ETUDE AU MICROSCOPE ELECTRONIQUE DE L'OXYDE DE BERYLLIUM IRRADIE (ELECTRON MICROSCOPE STUDY OF IRRADIATED BERYLLIUM OXIDE).
Doctoral thesis.
by Auguste Andre Bisson. 1966, 64p CEA-R-2963
Text in French; attached summary in English.

Descriptors: (*Refractory materials, Radiation damage), (*Radiation damage, Beryllium compounds), (*Beryllium compounds, Microstructure), Oxides, Fractography, Electron microscopy, Sintering, Annealing, Grain boundaries, Crystal lattice defects, Heat of activation, Diffraction analysis.

Identifiers: Beryllium oxides.

The beryllium oxide was studied first by fractography, before and after irradiation, using sintered samples. The fractures were examined under different aspects. The higher density sintered samples, with transgranular fractures were the most interesting for a microscopic study. The irradiated beryllium oxide was then studied by transmission. A simple method was used: little chips of the crushed material were examined. Clusters of point defects produced by neutrons were thus detected. The evolution of the clusters into dislocation loops was studied by a series of annealings. The activation energy (0.37 eV) calculated from the annealing curves suggests that it must be interstitials that condense into dislocation loops. Samples irradiated at high temperatures (650, 900 and 1 100C) were also studied. In those specimens the size of the loops is not the same as th equilibrium size obtained after out of pile annealing at the same temperature. Those former loops are more specifically studied and their Burgers vector is determined by microdiffraction. (Author)

PB-170 656 **Field 18J**
CFSTI Prices: HC$4.60 MF$0.50
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
ETUDE DU RISQUE D'OXYDATION LORS DU FRITTAGE DU BIOXYDE D'URANIUM ET CARACTERISATION DE L'OXYGENE EXCEDENTAIRE (Study of the Oxidation Risks during the Sintering of Uranium Dioxide, and Characterization of the Excess Oxygen).
by Madeleine Conte, and Maxime Brandela. 1966, 42p CEA-R-3003
Text in French; attached summary in English.

Descriptors: (*Reactor materials, Sintering), (*Uranium compounds, Sintering), (*Sintering, Oxygen), Dioxides, Pellets, Impurities, Vapor pressure, Water vapor, Dissociation, Grain structures (Metallurgy), Etched crystals, Microstructure, X-ray spectroscopy, France.

Identifiers: Uranous oxide.

During sintering in reducing atmospheres, UO2 pellets can be oxidised by gaseous impurities; the phenomena was studied with respect to the temperature cycle, the partial pressure of oxygen and the flow rate of the gas over the pellets. In these atmospheres, the oxygen partial pressure during sintering is low at high temperatures, as a consequence of the dissociation rate of the combined water vapor, but below 1000C, it can be high enough to result in a noticeable oxidation of the surface of the pellets during cooling. The cristalline phases which can occur were identified and two methods of detection were proposed: a micrographic examination after chemical etching and the radiocrystallography. (Author)

PB-170 994 **Field 18J, 18L**
CFSTI Prices: HC$30.40 MF$1.50
Kjeller Research Establishment (Norway). Institutt for Atomenergi.
ADVANCED COURSE ON FUEL ELEMENTS FOR WATER COOLED POWER REACTORS INCLUDING SUPERHEAT.
Rept. for 13 Sep-24 Sep 65.
by J. A. Firing, P. H. Margen, H. Mogard, D. O. Pickman, and J. A. L. Robertson. 24 Sep 65, 319p KR-89

Descriptors: (*Reactor fuel elements, *Power reactors), Training, Nuclear engineering, Uranium compounds, Dioxides, Zirconium alloys, Aluminum, Reactor materials, Norway.

PB-172 856 **Field 18J, 7D**
CFSTI Prices: HC$3.60 MF$0.50
Kjeller Research Establishment (Norway). Institutt for Atomenergi.
EQUILIBRIUM OXYGEN PRESSURES OVER THE NONSTOICHIOMETRIC URANIUM OXIDES UO2+x AND U308-z AT HIGHER TEMPERATURES.
by K. Hagemark, and M. Broli. May 66, 33p KR-102
Prepared in cooperation with Technical Univ., Trondheim (Norway). Institute of Silicate Science.

Descriptors: (*Uranium compounds, Oxides), (*Reactor fuels, Vapor pressure), Oxygen, Phase studies, Enthalpy, Entropy, Norway.

By use of a thermobalance the nonstoichiometry in the phases UO2+x and U308-z was determined as a function of the partial oxygen pressure at 900-1500C. Values for the partial free enthalpy of oxygen, as well as the enthalpy and entropy are given. Except at compositions for O/U less than 2.01, the agreement with adopted values in the phase UO2+x is excellent. However, the data obtained for the phase U3O8-z do not confirm the previously assessed partial thermodynamic quantities. The values obtained for the phase boundaries are consistent with values accepted in the literature. A quasi-theoretical relation between the oxygen pressure and the nonstoichiometry was derived. (Author)

AD-638 848 **See Field 18I**

N66-35044 **See Field 18G**

PB-173 259 **See Field 7E**

18K. REACTOR PHYSICS

N66-24417 **Field 18K**
CFSTI Prices HC$2.00 MF$0.50
European Atomic Energy Community, Brussels (Belgium).
FIRST FLIGHT COLLISION PROBABILITIES IN PIN CLUSTERS AND ROD LATTICES.
by L. Amyot, and P. Benoist. 1966, 30p EUR-2751.E

Descriptors: *Cluster, Collision, *Collision parameter, Computer, Flight, Ibm 7090 computer, Lattice, Method, Parameter, Physics, Pin, Probability, Program, Reactor, *Reactor physics, *Rod.

For abstract, see S 04 13.

N66-24884 **Field 18K**
CFSTI Prices HC$2.00 MF$0.50
Aktiebolaget Atomenergi, Stockholm (Sweden).
MEASURED AND PREDICTED NEUTRON FLUX DISTRIBUTIONS IN A MATERIAL SURROUNDING A CYLINDRICAL DUCT.
by J. Nilsson, and R. Sandlin. Mar 66, 42p AE-220

Descriptors: Activation, Attenuation, Cylinder, Deuterium, *Deuterium oxide, Distribution, *Duct, Fast, *Fast neutron, Flux, Foil, Heavy, Iron, Material, Measurement, Monte carlo method, Neutron, *Neutron flux, Oxide, Prediction, Radial, *Radial distribution, Scattering, Water.

For abstract, see S 04 13.

PB-170 995 **Field 18K**
CFSTI Prices: HC$1.10 MF$0.50
Kjeller Research Establishment (Norway). Institutt for Atomenergi.
MEASUREMENT OF THE SPATIAL VARIATION OF THE THERMAL NEUTRON ENERGY SPECTRUM IN REACTOR CELLS.
by J. Smit. Apr 66, 16p KR-103
Proj. Nora-22

Descriptors: (*Thermal neutrons, Reactor lattice parameters), (*Reactor lattice parameters, Thermal neutrons), Neutron flux, Power reactors, Norway.

The spatial variation of the thermal neutron spectrum is measured indirectly in terms of a spectrum index SI. These measurements were carried out in the zero-power reactor NORA in a mixture of heavy and light water (45 % H2O) and in four light water lattices with the lattice pitch and the moderator temperature as parameters. The experimental results are compared with calculations performed using the K-7 THERMOS code with the following three energy transfer models: the free gas model of Brown and St. John, Nelkin's model, and an anisotropic version of Nelkin's model due to Koppel and Young. The latter model gives in almost all cases satisfactory agreement with the experimental results. (Author)

PB-172 855 **Field 18K**
CFSTI Prices: HC$3.60 MF$0.50
Kjeller Research Establishment (Norway). Institutt for Atomenergi.
A STUDY OF SPACE-DEPENDENT TRANSFER FUNCTIONS.
by K. Haugset. May 66, 31p KR-107
Proj. Nora-25
Prepared for presentation at the EAES Symposium on Advances in Reactor Theory, Karlsruhe June 27 - 29, 1966.

Descriptors: (*Reactor theory, *Functions), Diffusion, Equations, Groups (Mathematics), Reactor reflectors, Mathematical models, Neutron flux, Oscillation, Norway.

Identifiers: NORA Reactor, Transfer functions.

Measurement of the spatial dependent transfer function was performed in the zero-power reactor NORA, using the oscillator rod method. Frequency range was from 0.03 cps to 120 cps, and large spatial effects were detected at high frequencies. The experimental results are compared with a theoretical model of the space-dependent transfer function. This model is based on spatial eigenfunc-

tion expansion. Two-group diffusion theory gives good agreement with experiment in the whole frequency range. (Author)

AD-639 572 **See Field 20H**

18L. REACTORS (POWER)

PB-170 994 **See Field 18J**

18M. REACTORS (NON-POWER)

N66-24883 **Field 18M**
CFSTI Prices HC$1.00 MF$0.50
India. Dept. Of Atomic Energy, Bombay.
PHYSICS ASPECTS OF LARGE THORIUM FUELLED FAST REACTORS.
by R. S. Singh. 1965, 18p AEET-229
Work Done In Part At Argonne Natl. Lab.

Descriptors: Coefficient, Composition, Core, Cross, Doppler effect, Effect, Fast, *Fast reactor, Fuel, Loss, Metal, Oxide, Reactivity, Reactor, *Reactor fuel, Resonance, *Resonance effect, Section, Sodium, Temperature, *Thorium, *Uranium 233.

For abstract, see S 04 13.

18N. SNAP TECHNOLOGY

N66-24442 **Field 18N**
CFSTI Prices HC$3.00 MF$0.75
Aerojet-general Corp., Azusa, Calif.
SNAP-8 MATERIALS REPORT SEMIANNUAL REPORT, 1 JAN. - 30 JUN. 1965.
by H. Derow, and B. E. Farwell. Jul 65, 89p
NASA-CR-54719
Contract NAS5-417
Its Rept.-3038

Descriptors: Additive, Alloy, Component, Corrosion, *Corrosion resistance, Design, Material, *Material testing, Mercury, Metal, Operation, Resistance, Rubidium, *Steel, *System for nuclear auxiliary power (snap) program, Testing.

For abstract, see S 04 13.

N66-25062 **Field 18N**
CFSTI Prices HC$7.15 MF$2.00
Aerojet-general Corp., Azusa, Calif.
SNAP-8 ELECTRICAL GENERATING SYSTEM DEVELOPMENT PROGRAM SEMIANNUAL PROGRESS REPORT, 1 DEC. 1964 - 30 JUN. 1965.
Aug 65, 415p NASA-CR-54848
Contract NAS5-417
Its Rept.-3053

Descriptors: Auxiliary, Conversion, Electric, Generator, Nuclear, Power, *Power conversion, Snap program, *Snap- 8, Space, System, Turboelectric, *Turboelectric conversion.

For abstract, see S 04 13.

19A. AMMUNITION, EXPLOSIVES, AND PYROTECHNICS

N66-25563 **Field 19A**
CFSTI Prices HC$5.00 MF$1.00
Space Ordnance Systems, Inc. El Segundo, Calif.
DEVELOPMENT OF AN ENVIRONMENTALLY IMMUNE ELECTROSTATIC INSENSITIVE APOLLO STANDARD INITIATOR FINAL REPORT.
by G. L. Drinkard. 16 Nov 65, 180p NASA-CR-65352
Contract NAS9-4147
Its Test Rept.-1112

Descriptors: *Apollo project, Circuit, *Circuit protection, Device, Discharge, Electric, *Electrostatics, Explosive, *Explosive device, Firing, Hazard, *Initiation, Initiator, Protection, Safety, Space, Testing.

For abstract, see S 04 14.

AD-483 130 **See Field 16D**

19B. BOMBS

PB-170 859 **See Field 1A**

19D. EXPLOSIONS, BALLISTICS, AND ARMOR

AD-639 146 **Field 19D, 8M**
CFSTI Prices: HC$3.00 MF$0.75
Army Engineer Research and Development Labs., Fort Belvoir, Va.
PRELIMINARY EXPERIMENTS FOR CRATER MODELING IN CONTROLLED SOIL MEDIA.
Interim technical rept.
by George Gornak. Jun 66, 87p Rept. no. 1862
Proj. DA-1N022601A089
Task 1N022601A08906

Descriptors: (*Cratering, *Soil mechanics), Moisture, Experimental data, Tests, Shock waves, Attenuation, Explosion effects, Measurement.

The report covers a series of 30-gram, high-explosive cratering tests performed to determine effect soil moisture content in relation to the soil's plastic limit has on craters, ground shock velocities, residual displacements, and rarefaction wave. The report concludes: (a) In a cohesive soil the moist condition (moisture content within the plastic index) as contrasted with the dry condition (moisture content well below the plastic limit) influences crater formation in the following ways. (1) Fallback into the crater is reduced so that apparent and true crater dimensions are identical. (2) The profile of the crater is more symmetrical and parabolic in shape. (3) The ejecta which consist of large clods, for the most part, are distributed near the crater lip. (4) The crater parameters of depth, diameter, and especially volume are considerably increased. (5) Attenuation rate of the shock velocity is lessened appreciably and results in higher shock velocities and pressures at greater distances from the center of the charge. (6) Larger soil displacements are obtained at any given distance from the center of the charge. (7) The possibility exists that a substantial increase in residual radiation may result from the lack of fallback material. (b) Large-scale results in marine muck and silty sand compared with results of this study reveal similarity in crater form. This suggests a general hypothesis that any soil which has moisture content that approaches the plastic limit will exhibit similar behavior. (Author)

AD-639 336 **Field 19D**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
A PROBLEM OF OPTIMUM MOTION OF BALLISTIC ROCKETS.
by A. S. Galiullin. 25 Apr 66, 6p FTD-TT-65-1918
TT-66-62316
Unedited rough draft trans. of Universitet Druzhby Narodov, Moscow. Trudy (USSR), v1 p68-70 1963.

Descriptors: (*Rocket trajectories, Optimization), USSR, Differential equations, Equations of motion.

N66-23944 **Field 19D**
CFSTI Prices HC$1.10 MF$0.50
Cambridge Univ. (England).
GROWTH OF BURNING TO DETONATION IN LIQUIDS AND SOLIDS ANNUAL SUMMARY REPORT NO. 8, NOV. 1964 - NOV. 1965.
by F. P. Bowden. Nov 65, 8p AFOSR-66-0406, AD-628915
Contract AF-EOAR-65-24

Descriptors: Burning, Combustion, Crystal, *Detonation, *Explosive, Fracture, *Fracture mechanics, Geometry, Great britain, High speed, Inert, Liquid, Mechanics, Photographic, *Photographic recording, Recording, Single, Solid.

For abstract, see S 04 13.

AD-639 213 **See Field 20K**

19E. FIRE CONTROL AND BOMBING SYSTEMS

AD-638 787 **Field 19E, 18G**
CFSTI Prices: HC$1.60 MF$0.50
General Dynamics Corp., Groton, Conn. Electric Boat Div.
DISCUSSION OF A GRAPHICAL METHOD FOR OBTAINING DEFLECTION ANGLES.
Technical rept.
by H. M. Kaufman, and J. Malitz. 15 Dec 60, 11p
SPD-60-132
Contract Nonr-2640 (00)
See also AD-270 438.

Descriptors: (*Graphics, Fire control systems), (*Acoustic torpedoes, *Fire control systems), Deflection, Targets.

Identifiers: Angle of deflection.

AD-639 036 **See Field 5I**

AD-639 038 **See Field 5I**

AD-639 275 **See Field 5I**

19F. GUNS

AD-639 322 **Field 19F, 11C, 13H**
CFSTI Prices: HC$3.00 MF$0.50
Springfield Armory, Mass.
INORGANIC COATINGS FOR SPRING APPLICATIONS.
Technical rept.
by A. H. LaRiviere, and G. Pributsky. 30 Jun 66, 53p SA-TR18-1094
Proj. DA-M1-3-23043

Descriptors: (*Springs, Coatings), (*Small arms, Springs), Fatigue (Mechanics), Life expectancy, Inorganic compounds, Hydrogen embrittlement, Abrasive blasting, Cold working, Helical springs, Surfaces.

Inorganic coatings and surface pretreatments (such as vaporblast, gritblast, and shot-peening processes) were investigated and evaluated to determine their effect on fatigue life of experimental helical springs used in small arms weapons systems. Surface pretreatment improves fatigue life of both coated and noncoated springs. The use of surface pretreatment such as shot-peening eliminates the necessity of baking to minimize hydrogen embrittlement effects. The shot-peening process not only provided the greatest improvement in fatigue life but also minimized the hydrogen embrittlement from the various coating processes. Test procedure is described and results discussed. (Author)

20. PHYSICS

N66-25584 **Field 20**
CFSTI Prices HC$3.00 MF$0.50
Grumman Aircraft Engineering Corp., Bethpage, N. Y.
NUMERICAL CALCULATIONS OF GAS-SURFACE INTERACTIONS.
by R. A. Oman. May 66, 53p NASA-CR-481
Contract NASW-1027

Descriptors: Correlation, Crystal, *Crystal lattice, Distribution, Energy, *Energy exchange, Epithermal, Exchange, Flux, Gas, *Gas-solid interface, Interaction, Interface, Lattice, Momentum, Solid, Space, Structure, Surface, *Surface interaction.

For abstract, see S 04 14.

N66-26546 Field 20
CFSTI Prices HC$7.77 MF$2.25
Rocketdyne, Canoga Park, Calif.
THE DESIGN AND ANALYSIS OF SENSITIVITY EXPERIMENTS, VOLUME I AND VOLUME II.
by M. J. Alexander, D. Rothman, and J. M. Zimmerman. May 65, 477p NASA-CR-62026, VOL. I, NASA-CR-62026, VOL. II
Contract NAS8-11061

Descriptors: Block, Computer, Design, Experiment, *Experiment design, Fortran, Function, Inverse, Process, Program, Response, *Sensitivity, Sequence, Simulation, *Stimulus, Stochastic, *Stochastic process, Variable.

For abstract, see S 04 14.

N66-26749 Field 20
CFSTI Prices HC$8.91 MF$2.75
Massachusetts Inst. Of Tech., Cambridge.
RESEARCH IN MATERIALS, SCIENCE AND ENGINEERING ANNUAL REPORT 1965-1966.
Apr 66, 591p NASA-CR-75156
Contracts NAS8-11091, NAS9-3079

Descriptors: Crystallography, Development, Engineering, *Engineering development, Environment, Field, Low temperature, *Low temperature physics, Magnetic, Material, *Materials science, Physics, Plasma, *Plasma physics, Project, Research, *Research project, Science, Semiconductor, Solid, *Solid state physics, Space, State.

For abstract, see S 04 14.

20A. ACOUSTICS

AD-638 857 Field 20A, 11B
Not available from CFSTI.
Lamont Geological Observatory, Palisades, N. Y.
PRESSURE DERIVATIVES OF THE SOUND VELOCITIES OF POLYCRYSTALLINE ALUMINA.
by Edward Schreiber, and Orson L. Anderson.
26 Jul 65, 8p Contrib-892
Contract AF 49 (638)-1355
Prepared for presentation at the Fall Meeting, Basic Science Div., The American Ceramic Society, Pittsburgh, Pa., 21 Sep 65.
Availability: Published in Journal of the American Ceramic Society v49 n4 p184-90 Apr 1966.

Descriptors: (*Sound transmission, Aluminum compounds), (*Aluminum compounds, Oxides), Pressure, Crystals, Velocity, Measurement.

The sound velocities and the pressure derivatives of the sound velocities were measured on a small specimen of polycrystalline alumina by the method of 'pulse superposition.' The pressure derivatives found from experiments up to 4 kbars at 25 C are: dv sub s/dP = 0.002207 km/sec/kbar (shear wave); dv sub p/dP = 0.005175 km/sec/kbar (longitudinal wave). These values lead to the variation of Poisson's ratio with pressure of do/dP = 0.000102 x 10-4/kbar and to the variation of (isothermal) bulk modulus with pressure of dBTsub/dP = 3.99. Using the above values the compression is computed up to 400 kbars and compares well with shock wave measurements. Consequently, the measured pressure derivatives may hold up to several hundred kilobars. (Author)

AD-638 858 Field 20A, 11B
Not available from CFSTI.
Lamont Geological Observatory, Palisades, N. Y.
TEMPERATURE DEPENDENCE OF THE VELOCITY DERIVATIVES OF PERICLASE.
by Edward Schreiber, and Orson L. Anderson.
1 Nov 65, 7p Contrib-906
Contract AF 49 (638)-1355
Prepared in cooperation with Bell Telephone Labs., Inc., Murray Hill, N. J.
Availability: Published in Journal of Geophysical Research v71 n12 p3007-12 Jun 15 1966.

Descriptors: (*Sound transmission, Magnesium compounds), (*Magnesium compounds, Oxides), Crystals, Temperature, Measurement, Velocity.

Identifiers: Magnesium oxide.

The temperature dependence of the sound velocity in polycrystalline MgO has been determined by +80 to -80 C at atmospheric pressure and to 2 kb at -785 C. These results are compared with previous measurements to 4 kb at 34.6 C. From these measurements the critical temperature gradient (delta T/delta P)v for MgO was determined. Because (delta T/delta P)v was found to be greater for P waves than for S waves in MgO, and both are small compared with previously reported values at (delta T/delta P)v for the earth, it is possible to explain the marked presence of a low-velocity zone for S waves and the absence of a low-velocity zone for P waves in a homogeneous earth. (Author)

AD-638 957 Field 20A
Not available from CFSTI.
National Bureau of Standards, Washington, D. C. Inst. for Basic Standards.
BAFFLED PISTON RADIATOR: EXPANSION OF POTENTIAL IN FAR, PARAXIAL FIELD.
by Martin Greenspan. 1965, 2p
Availability: Published in The Journal of the Acoustical Society of America v40 n1 p251-2 Jul 1966.

Descriptors: (*Acoustic equipment, *Potential theory), Baffles, Asymptotic series.

AD-638 980 Field 20A
CFSTI Prices: HC$2.00 MF$0.50
Saint Anthony Falls Hydraulic Lab., Univ. of Minnesota, Minneapolis.
A STUDY OF THE INFLUENCE OF MICROBUBBLES ON HYDRODYNAMIC FLOW NOISE.
Final rept.
by John M. Killen, and Scott D. Crist. Apr 66, 26p
Project rept-82
Contract Nonr-710 (65)
Proj. S-R009-01-01

Descriptors: (*Cavitation noise, *Bubbles), Rotation, Cylindrical bodies, Boundary layer, Hydrodynamics, Acoustics.

A test facility was constructed for the measurement of flow noise generated by a rotating cylinder in water. Measurements were made of radiated flow noise in water for a frequency range of 5 to 80 kiloHertz. The surface velocities of the cylinder were varied from 44 to 100 fps. The total air content of the water was varied from 7 to 27 ppm. The radiated flow noise was observed to increase as the sixth power of the surface velocity for low frequencies. For high frequencies, the flow noise increased as the tenth power of the velocity. Release of air bubbles by shear had no effect on radiated flow noise other than to reduce the measured level of the noise. (Author)

N66-24490 Field 20A
CFSTI Prices HC$2.00 MF$0.50
Rocketdyne, Canoga Park, Calif.
PUMP DISCHARGE OSCILLATION STUDY QUARTERLY PROGRESS REPORT NO. 3, 1 JAN. - 31 MAR. 1966.
by E. Jackson. 13 Apr 66, 43p NASA-CR-74555, TAMM-6115-22
Contract NAS8-20143

Descriptors: *Acoustics, Anemometer, Cavitation, Diffuser, Discharge, Elbow, Fuel, Generation, Hot wire, Orifice, Oscillation, *Pump, Test, Transmission, Viscous, Wake, Wave, *Wave generation.

For abstract, see S 04 13.

N66-24941 Field 20A
CFSTI Prices HC$4.00 MF$0.75
Bolt, Beranek, And Newman, Inc., Cambridge, Mass.
STUDIES OF THE NEAR-FIELD NOISE PROPERTIES OF A SMALL AIR JET FINAL REPORT.
by D. N. Keast, and G. Maidanik. Feb 66, 103p NASA-CR-74699
Contract NAS1-4656
Its Rept.-1272

Descriptors: *Acoustics, Air, *Air jet, Convection, Eddy, Effect, Field, Jet, *Jet noise, Measurement, Noise, Property, Size, Sound, Spectrum, Supersonic, *Supersonic jet, Turbulence, *Turbulence effect, Velocity.

For abstract, see S 04 13.

N66-34346 Field 20A
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
GROUND TESTING AT MSFC.
1965, 48p NASA-TM-X-53486
Its Res. Achievements Rev., Ser. No. 9

Descriptors: Empirical, Field, Ground, *Ground test, Instrumentation, Model, Noise, Noise suppressor, Rocket engine, Sound, *Sound field, *Static testing, Suppressor, Test.

For abstract, see S 04 20.

N66-34685 Field 20A
CFSTI Prices HC$5.00 MF$1.25
Texas Western Coll., El Paso.
GROUND SUPPORT, DATA ANALYSIS AND ASSOCIATED RESEARCH AND DEVELOPMENT FOR THE ROCKET GRENADE EXPERIMENT FINAL REPORT, 16 AUG. 1961 - 31 MAY 1965.
by J. F. Casey. Jun 65, 197p NASA-CR-77235
Contract NAS5-2949

Descriptors: Absorption, Analysis, Array, Data, *Data analysis, Equipment, Experiment, *Grenade, Ground, Level, Measurement, Noise, *Noise measurement, Ranging, Sound, *Sound ranging, Support, Tube.

For abstract, see S 04 20.

N66-35185 Field 20A
CFSTI Prices HC$1.00 MF$0.50
Wyle Labs., Inc., El Segundo, Calif.
AERODYNAMIC NOISE RESEARCH SUPPORT QUARTERLY PROGRESS REPORT, APR. - JUN. 1966.
by M. V. Lowson. 30 Jun 66, 10p NASA-CR-77523
Contract NAS8-11308

Descriptors: *Acoustics, Escape, Feedback, Fluctuation, Interaction, Level, Mechanism, Pressure, Response, Separator, Shock, *Shock wave, Sound, Tower, *Turbulent wake, Wake, Wave.

For abstract, see S 04 20.

PB-170 731 Field 20A
CFSTI Prices: HC$3.00 MF$0.50
Bolt, Beranek and Newman, Inc., Van Nuys, Calif.

THE EFFECTS OF DURATION AND BACKGROUND NOISE LEVEL ON PERCEIVED NOISINESS.
Technical rept.
by Karl S. Pearsons. Apr 66, 57p
Contract FA65WA-1180
FAA-ADS-78

Descriptors: (*Airplane noise, Background), (*Noise, Acceptability), Tests.

Judgment tests were conducted to investigate the effect of duration and background noise on the perceived noisiness of sounds. The tests were conducted in an anechoic chamber with 18 subjects. Aircraft noise recordings were employed in the background level test, and the results indicate that the presence of background noise reduces the judged noisiness of an aircraft flyover. The duration tests utilized stimuli with two different time patterns and various spectrum shapes over a range of durations from 4 to 64 seconds. Combining the results of these tests with those of a previous study provided duration information over the range from 1-1/2 to 64 seconds. These data suggest that the dependence of perceived noisiness on duration might well be a function with a continuously decreasing slope, varying from -6 to -2 PNdB per doubling of duration over the range of durations tested. For practical purposes, we have approximated the data by straight-line segments for various ranges of duration. (Author)

AD-483 469 **See Field 20C**

AD-638 759 **See Field 4A**

AD-639 161 **See Field 20M**

AD-639 363 **See Field 6S**

AD-639 589 **See Field 8J**

20B. CRYSTALLOGRAPHY

AD-483 952 **Field 20B**
CFSTI Prices: HC$2.00 MF$0.50
Midwest Research Inst., Kansas City, Mo.
THE STRENGTH AND STRUCTURE OF EPITAXIAL FILMS.
Final rept., 1 Mar 65-1 Mar 66.
by R. A. Connell. 15 Jun 66, 41p MRI-2853-P
Contract Now-65-0320

Descriptors: (*Epitaxial growth, Films), (*Metal films, Gold), Sodium, Chlorides, Substrates, Impurities, Tensile properties, Thickness, Copper, Doping, Molybdenum, Oxides, Whiskers (Crystals), Test equipment, Design, Nucleation, Microphotography.

A series of epitaxial gold films was grown on sodium chloride substrates under a variety of conditions to determine effects of various types of grown-in impurities. Tensile tests were attempted on seven films of approximately 1,000 a thickness, but because of localized flaws or damage incurred during mounting, no useful tensile data were obtained. Consequently, interests centered primarily on changes in the microstructure of the films as determined by electron transmission microscopy, and on their implications for related tensile properties. Films were deposited at rates of the order of L a/sec in an all-metal bakeable system capable of operation in the ultrahigh vacuum range. Both cleaved and polished substrates were used at temperatures ranging between 280 C and 400 C. Micrographs of films prepared in a 10 to the-7th power torr vacuum were compared with those of films grown in approximately 0.00001 torr atmospheres of dry air and H2O. It was established that these contaminants produced only secondary effects on the film structure. By contrast, contamination with molybdenum-oxide produced by the reaction of the crucible with an oxidizing atmosphere change the structure completely and virtually eliminated visible stacking faults or twins. Similarly the addition of 1.5 atomic per cent CU to the melt and subsequent evaporation to completion resulted in alloy films with very little regular structure. (Author)

AD-638 782 **Field 20B, 11F**
Not available from CFSTI.
National Research Council of Canada, Ottawa (Ontario). Div. of Applied Chemistry.
UBER ORTSANDERUNGEN VON SILBERATOMEN IN KORNGRENZENDIFFUSIONS- PROZESSEN VON ZINN (On the Grain Boundary Diffusion of Silver in Tin).
by Laszlo J. Bartha. 1966, 2p
Text in German.
Availability: Published in Ortsanderungen von Ag-Atomen v57 n6 p482-3 1966.

Descriptors: (*Silver, Diffusion), Hungary, Grain boundaries, Volume, Tin, Temperature, Numerical methods and procedures.

The thin layer method was employed for measuring the volume and grain boundary diffusion of silver and tin to determine the diffusion constants and temperature dependence. A numerical computation of the motion of silver atoms in tin based on the present results yields agreement with previous data. (Author)

AD-639 345 **Field 20B, 7D**
CFSTI Prices: HC$3.00 MF$0.50
Brown Univ., Providence, R. I.
STUDY OF SURFACE PROPERTIES OF ATOMICALLY-CLEAN METALS AND SEMICONDUCTORS.
Rept. no. 9, 1 Jan-30 Jun 66 (final).
by H. E. Farnsworth, B. D. Campbell, and M. Onchi. Sep 66, 58p
Contract DA-28-043-AMC-00299 (E)
Proj. DA-200-14501-B11B
ECOM-00299-F
See also AD-630 863.

Descriptors: (*Semiconductors, Surface properties), (*Nickel, Adsorption), Oxygen, Cadmium compounds, Sulfides, Zinc compounds, Nitrogen compounds, Heat of activation, Electron diffraction analysis, Mass spectroscopy, Work functions.

Identifiers: Cadmium sulfide, Zinc oxide.

Activation energies were measured for the adsorption and desorption of oxygen on cadmium sulfide surfaces. On the basis of these and other results it is suggested that there are two types of oxygen adsorption. One type produces charged surface states, the other leads to a dipole layer. Preliminary observations were made on a zinc oxide crystal. No photoenhanced uptake of oxygen was noted and no changes in surface photovoltage were obtained.

AD-639 410 **Field 20B**
Not available from CFSTI.
Washington Univ., Seattle. Dept. of Chemistry.
PARAMETER INTERACTIONS AND THE FERROELECTRIC MECHANISM IN GUANIDINIUM ALUMINUM SULFATE HEXAHYDRATE.
Revised ed.
by E. C. Lingafelter, P. L. Orioli, B. J. B. Schein, and J. M. Stewart. 19 Jul 65, 5p
Grant DA-ARO (D)-31-124-G459
AROD-4365:1
Revision of manuscript submitted 17 Jul 63. Prepared in cooperation with Maryland Univ., College Park. Dept. of Chemistry.
Availability: Published in Acta Crystallographica v20 pt3 p451-5 Mar 1966.

Descriptors: (*Ferroelectric crystals, *Crystal structure), Guanidines, Aluminum compounds, Sulfates, Hydrates, Least squares method, Chemical bonds, Symmetry (Crystallography).

Identifiers: Guanidinium aluminum sulfate.

A detailed examination of the large correlation coefficients between parameters in the attempted full-matrix least-squares refinement of the ferroelectric guanidinium aluminum sulfate hexahydrate (GASH) shows that they arise from three factors: (1) the polar nature of the space group P31m, (2) the nonorthogonality of the a and b axes, and (3) the presence of a pseudo-center of symmetry at 5/6, 1/6, 0.54. Reversal of the direction of polarization of a crystal of GASH can be accomplished by displacement of all atoms except those of one guanidinium ion by a mean distance of about 0.15A and rotation of the one guanidinium ion through 60 degrees about the carbon atom and in its own plane. (Author)

AD-639 520 **Field 20B**
Not available from CFSTI.
Madrid Univ. (Spain).
THERMAL EXPANSION OF BETA-SUCCINIC ACID AND ALPHA-ADIPIC ACID IN RELATION TO THEIR CRYSTAL STRUCTURES.
Interim rept.
by J. L. Amoros, M. L. Canut, and E. Neira. 3 Nov 64, 15p
Grant AF-EOAR-62-92
Proj. AF-9761
Task 976102
AFOSR-66-1611
Revision of manuscript submitted 13 Feb 64.
Availability: Published in Proceedings of the Royal Society A v285 p370-81 1965.

Descriptors: (*Succinic acids, Thermal expansion), (*Dibasic acids, Thermal expansion), (*Thermal expansion, *Crystal structure), X-ray diffraction analysis, Molecular association, Crystal lattices, Symmetry (Crystallography), Spain.

Identifiers: Adipic acid.

The thermal expansion quadries of Beta-succinic acid and Alpha-adipic acid were determined by X-ray Weissenberg method. In adipic acid, X-ray measurements were made between -150 and + 130C. In these monoclinic crystals, the minimum expansion corresponds to the c axis, which coincides with the direction of the hydrogen-bonded molecular columns. In other directions along which van der Waals forces prevail, thermal expansion is greater, being maximum perpendicular to the (100) planes, the direction of the obtuse bisectrix of the molecular packing angle. The thermal expansion is quantitatively explained by assuming an increase in the angular vibration of the molecules. (Author)

N66-25378 **Field 20B**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
EFFECT OF PREDEFORMATION ON THE MECHANICAL PROPERTIES OF SODIUM CHLORIDE CRYSTALS.
by P. J. Shlichta. 1 May 66, 42p NASA-CR-74952. JPL-TR-32-923
Contract NAS7-100

Descriptors: Atmospheric, Bending, Chloride, *Crystal, *Deformation, Ductility, Embrittlement, Mechanical, *Mechanical property, Polishing, Property, Salt, Sodium, *Sodium chloride, Strain, Stress, Water.

For abstract, see S 04 13.

N66-35192 **Field 20B**
CFSTI Prices HC$2.00 MF$0.50
Royal Military Coll. Of Science, Shrivenham (England).
THE GROWTH OF SINGLE CRYSTALS NICKEL OXIDE.
by M. C. Lovell. 1963, 32p
Contract AR/B/1MG/196/01/2

Descriptors: Arc, Crystal, *Crystal growth, Epitaxy, Floating, Furnace, Growth, Heat.

Image, Magnesium, Method, Nickel, *Nickel oxide, Oxide, Single, *Single crystal, Source, Substrate, Technique, Vapor, Zone.

For abstract, see S 04 20.

AD-638 869 **See Field 7B**

AD-638 918 **See Field 8G**

AD-639 001 **See Field 11F**

AD-639 054 **See Field 20L**

AD-639 056 **See Field 11F**

AD-639 271 **See Field 20L**

AD-639 555 **See Field 11F**

AD-639 603 **See Field 11F**

20C. ELECTRICITY AND MAGNETISM

AD-483 469 **Field 20C, 20A**
CFSTI Prices: HC$6.00 MF$1.50
Microwave Lab., Stanford Univ., Calif.
FREQUENCY CONVERSION AND AMPLIFICATION USING DOPPLER-SHIFT METHODS IN SOLIDS.
Technical rept.
by Chen S. Tsai. Dec 65, 279p Rept. no. 1395
Contract AF 49 (638)-1429
Proj. AF-9768
Task 976802

Descriptors: (*Frequency shift, Doppler effect), Electromagnetic wave reflections, Electromagnetic waves, Acoustics, Sound, Lasers, Diffraction, Rutile, Reflection, Frequency shift converters, Light, Mathematical prediction, Nonlinear systems, Field theory, Partial differential equations, Ferroelectric materials, Ferromagnetic materials.

The interaction of electromagnetic and acoustic waves with moving reflectors in solids was investigated. The first part of the study contains theoretical predictions of the frequency shifts and amplitude changes of an electromagnetic or acoustic wave after interacting with a moving interface between regions of different characteristic impedances or a series of such moving interfaces, termed the Moving Reflector Theory. The second part contains experimental results concerning the diffraction of laser light using kilomegacycle acoustic waves in solids. The theory predicts that a high frequency amplification or deamplification of an electromagnetic wave can probably be obtained more easily by reflecting from a moving interface or a series of moving interfaces which are induced by sending an electromagnetic pumping signal into a nonlinear material. The theory also predicts that a frequency shift which occurs in a wave (transmitted through a moving nonabrupt interface) is independent of the width of the interface and the conversion of a longitudinal acoustic wave to a transverse acoustic wave or vice versa in a ferromagnetic material. Various ways of enhancing the amount of diffraction were employed to achieve a large diffraction. Using a suitable crystal (TiO_2) and a high-efficiency transducer (ZnO wafer) giving a ribbon-shaped acoustic beam, it was possible to diffract in the first-order 10% of the incident light using 15 watts of cw rf power, and 60% diffraction was achieved with a pulse 60 watts peak power source. In the high power experiments additional diffracted spots of light (second- and third-order) appeared; these are also compared with calculated value.

AD-638 761 **Field 20C, 4A**
CFSTI Prices: HC$5.00 MF$1.25
Avco Corp., Wilmington, Mass. Research and Advanced Development Div.
SPECTROMETER FOR ATMOSPHERIC IONS IN THEIR UPPERMOST RANGE OF MOBILITY.
Final scientific rept.
by Hans Dolezalek, and August L. Oster. 3 Sep 65, 187p RAD-TR-65-25
Contract DA-19-020-AMC-0058 (X)
Report on project Measuring Ionic Mobilities in the Terrestrial Upper Stratosphere and Mesosphere--Phase I, See also AD-463 032.

Descriptors: (*Spectrum analyzers, Ions), (*Ionic current, Measurement), Stratosphere, Upper atmosphere, Wind tunnels, Counting methods, Conductivity.

In the past, the mobility of atmospheric ions, and the number density in different mobility ranges (Ion Spectrum) have been measured in the terrestrial atmosphere in the heights from ground to about 5 km. Electric conductivities of the atmosphere have been measured up to about 30 km, and ion number densities to about 75 km. To extend the possibility of ion spectrum measurements up to the same height, a new method has been developed and tested in the laboratory. Its application in the free atmosphere is being prepared. The instrument may be used in planetarian atmosphere. The method consists of a GERDIEN-type 'differential ion counter of the second order,' providing a predetermined location of ion intake and a number of separate receiving electrodes for the ion impact. The driving voltage is a.c., its amplitude is increasing downstream the chamber. A low pressure wind tunnel for continuous operation, mostly in the subsonic range, has been developed and constructed for the laboratory experiments. This tunnel and its possible applications for other purposes are discussed. (Author)

AD-638 802 **Field 20C**
CFSTI Prices: HC$1.00 MF$0.50
Naval Research Lab., Washington, D. C.
THE MAGNETIC TORQUE OF IDEAL SUPERCONDUCTING TOROIDS.
Final rept.
by E. E. King. 9 Aug 66, 7p NRL-6414
RR-010-01-44-5601

Descriptors: (*Superconductors, Magnetic moments), (*Magnet coils, Superconductors), (*Torque, Magnetic moments), Magnetism, Bodies of revolution, Magnetic properties, Mathematical prediction.

Torsional experiments were performed at this laboratory with superconducting toroids. In order to discuss the results, knowledge of the expected behavior of an ideal superconducting toroid is needed. Equations which describe this ideal behavior were found in terms of three geometrically dependent constants, namely, the proportionality constants between components of the applied magnetic field and components of the magnetic moment of the toroid resulting from flux expulsion and any net current. Calculations of these three constants are available for toroids of circular cross sections from other NRL Reports. It is possible to estimate values for other than circular cross sections. (Author)

AD-638 877 **Field 20C**
CFSTI Prices: HC$2.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
INFLUENCE OF RARE EARTH IONS ON FERRIMAGNETIC RESONANCE.
by Ho Yu-ping, and Meng Xian-zhen. 31 May 66, 45p FTD-TT-65-901
TT-65-64341
Edited trans. of Wu Li Hsueh Pao (Chinese People's Republic) v20 n5 p387-482 1964.

Descriptors: (*Magnetic resonance, *Rare earths), Ferrites, Ions, Resonant frequency, Magnetism, China.

The ferrimagnetic resonance of the tight exchange coupled system was discussed in the light of the correlation method (theory of Kubo). The resonance field, H sub o (or resonance frequency) and the line width 2 delta w of the ferromagnetic branch, and also that of the exchange, were determined from a general magnetic susceptibility tensor formula. Results indicate that so-called fast relaxation and slow relaxation are but two branches (the transverse and longitudinal) of the ferromagnetic resonance. (Author)

AD-638 910 **Field 20C**
CFSTI Prices: HC$6.00 MF$1.25
Cruft Lab., Harvard Univ., Cambridge, Mass.
MAGNETIC RELAXATION IN RARE EARTH DOPED GARNET.
by Thomas Penney III. Apr 66, 234p Scientific-8-ser-3
Contract AF 19 (628)-3874
Proj. AF-5635
Task 563503
AFCRL-66-304

Descriptors: (*Ferromagnetic materials, Relaxation time), Rare earth elements, Ferromagnetism, Magnetic resonance, Ytterbium, Terbium, Doping, Yttrium compounds, Iron compounds, Garnet.

The parallel pump instability (PPI) has been measured in Yb3+ doped YIG. The spin wave linewidth delta H sub k has a broad peak near 100K similar to the resonance linewidth peak. For 0.05% doping the PPI data in the (111) direction fits T delta H sub k = 530 csch (28.6/T) + 4.3 csch (4.5+T) from 1.8K to 40K, indicating a Van Vleck-Orbach longitudinal relaxation from two doublets. The 28.6K value is the effective splitting of Yb (3+) doublets on c sites. However, the 4.5K splitting is probably associated with a small number of Yb (3+) ions on a sites. The small effect of 4.5K term is masked in resonance measurements by the constant low temperature linewidth due to two magnon scattering. In contrast, the PPI relaxation rate is independent of two magnon scattering. The 4.5K doublet may well be related to a near crossing of energy levels which probably causes the anomalous low temperature peaks in delta H and resonance field observed by Dillon. (Author)

AD-639 002 **Field 20C, 7D, 20H, 20L K**
Not available from CFSTI.
National Magnet Lab., Mass. Inst. of Tech., Cambridge.
HIGH FIELD MAGNETS AND MAGNETOSPECTROSCOPY.
Interim scientific rept.
by Benjamin Lax. 28 Jul 66, 27p
Contract AF 49 (638)-1468
Proj. AF-9764
Task 61445014
AFOSR-66-1646
Availability: Published in Proceedings of the AFOSR Scientific Seminar (10th) Anniversary p138-61 14-25 Jun 1965.

Descriptors: (*Magnets, Scientific research), (*Magnetic fields, State-of-the-art reviews), (*Spectroscopy, Magnetism), Cryogenics, Low-temperature research, Solenoids, Superconductors, Solid state physics, Magneto-optic effect, Atomic energy levels.

Identifiers: Fermi surfaces, de Haas-van Alphen effect.

CONTENTS (State-of-the-art review): (I) High field magnets: pulsed magnets; water-cooled magnets; low-temperature magnets; present status and future possibilities. (II) Magnetospectroscopy: solid state physics; intraband effects; interband effects; oscillatory effects.

AD-639 164 **Field 20C, 20G**
CFSTI Prices: HC$3.00 MF$0.75
Harry Diamond Labs., Washington, D. C.
ELECTROSTATIC FOCUSING OF AN ELECTRON SHEET BEAM IN A SYMMETRIC PLANAR STRUCTURE.
by B. J. Udelson. Aug 66, 57p TR-1324
Projs. HDL-96300, DA-1P5230018300

Descriptors: (*Electron beams, Focusing), (*Focusing, Electrostatics), Sheets.

The relative merits of electrostatically focused electron-sheet beams are evaluated with respect to their use in both 0-type and transverse-field devices. Several practical structures for attaining this type of focusing are described. The parameters of interest in a symmetric planar electrostatic-focusing structure--beam perveance, transverse resonant frequency, beam stiffness, and the condition of beam instability--are evaluated analytically as a function of focusing-structure dimensions and applied focusing voltages. The analytic calculations are compared with digital-computer solutions of the paraxial-ray equation as well as with experiment. The beam motion in the unstable region and the electron motions within the beam are also investigated by analog-computer solutions of the paraxial-ray equation. Finally, methods for containing lateral beam spread are discussed. (Author)

AD-639 246 **Field 20C, 17B**
CFSTI Prices: HC$1.00 MF$0.50
Navy Electronics Lab., San Diego, Calif.
ELF SURFACE ELECTRIC AND MAGNETIC FIELDS AND UNDERWATER ELECTRIC FIELDS.
Research rept., Mar 65-May 66.
by H. G. Hughes. 27 May 66, 21p NEL-1379
Projs. SR 104 03 01, NEL-M50161
Task 0592

Descriptors: (*Electromagnetic fields, Extremely low frequency), Measurement, Underwater communication systems, Environmental tests.

Measurements of elf noise on land and under the ocean to depths of 1000 feet were made in a joint NEL-USL program. Spectral analysis of recorded data is presented. Underwater measurements revealed significant peaks in the region of the first resonant frequency of the earth-ionosphere cavity between 7 and 10 c/s. (Author)

AD-639 334 **Field 20C, 20M, 20I, 12A K**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
INTEGRATING DIFFERENTIAL EQUATIONS OF A COLUMN OF AN ARC WITH ISOTHERMAL PLASMA WHICH IS COOLED BY MEANS OF HEAT CONDUCTIVITY.
by I. K. Fedchenko, and O. S. Ilenko. 18 Apr 66, 10p FTD-TT-65-1767
TT-66-62314
Unedited rough draft trans. of Akademiya Nauk URSR, Kiev. Dopovidi, n7 p925-9 1964.

Descriptors: (*Electric arcs, *Plasma physics), (*Thermodynamics, Electric arcs), (*Differential equations, Integration), Irreversible processes, USSR.

AD-639 480 **Field 20C**
Not available from CFSTI.
California Univ., San Diego, La Jolla.
SUPERCONDUCTIVITY IN ONE AND TWO DIMENSIONS.
by T. M. Rice. 19 Jul 65, 5p
Contract Nonr-2216 (11), Grant AF-AFOSR-610-64
Proj. AF-9761
Task 976101
AFOSR-66-1554
Availability: Published in Physical Review v140 n6A pA1889-91 Dec 13 1965.

Descriptors: (*Superconductivity, Statistical functions), Thermodynamics.

The effect of thermodynamic fluctuations on off-diagonal long-range order (ODLRO) is discussed. The two-particle Yang correlation function is calculated using the Ginzburg-Landau theory allowing such fluctuations. The behavior of the correlation function at large separation is examined and it is found to be consistent with Yang's criterion for ODLRO only in three dimensions. In one and two dimensions Yang's criterion is not satisfied. (Author)

AD-639 504 **Field 20C, 20L**
Not available from CFSTI.
Durham Univ. (England). Dept. of Physics.
THE MAGNETIC PROPERTIES OF C-d1-xYxCo2 COMPOUNDS.
by K. N. R. Taylor, H. D. Ellis, and M. I. Darby. 18 Jan 66, 4p
Grant AF-EOAR-75-63
Proj. AF-9763
Task 976302
AFOSR-66-1555
Availability: Published in Physical Letters v20 n4 p327-8 Mar 1966.

Descriptors: (*Gadolinium compounds, Magnetic properties), (*Yttrium compounds, Magnetic properties), (*Cobalt compounds, Magnetic properties), Intermetallic compounds, Temperature, Magnetic moments, Nuclear spins, Great Britain.

The magnetic properties of a series of compounds Gd1-xYxCo2 were measured. A model is proposed, to account for the anomalous magnetization curves which occur in this type of material. (Author)

N66-25019 **Field 20C**
CFSTI Prices HC$2.00 MF$0.50
Astro Research Corp., Santa Barbara, Calif.
ELECTROMAGNETIC FORCES ON SPACE STRUCTURES.
by W. M. Robbins Jr. May 66, 38p NASA-CR-476
Contract NASW-652

Descriptors: Antenna, Axial, *Axial stress, Charge, Conducting, Conductor, Disk, Electric, *Electric conductor, Electromagnetic, *Electromagnetic field, Electrostatic, Field, Force, *Force field, Loop, Moment, Sphere, Stress, Structure, Tensile, *Tensile stress, Wire.

For abstract, see S 04 13.

N66-26285 **Field 20C**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
POWER SPECTRAL DENSITY ANALYSIS.
by C. D. Hayes. 15 Jun 66, 16p NASA-CR-75154, JPL-TR-32-928
Contract NAS7-100

Descriptors: Acceleration, Decibel, Density, *Density distribution, Distribution, Error, Frequency, Logarithm, Mean, Power, *Power spectrum, Root, *Root-mean-square error, Spectrum, Square, Voltage.

For abstract, see S 04 14.

N66-34639 **Field 20C**
CFSTI Prices HC$3.00 MF$0.75
Avco-everett Research Lab., Everett, Mass.
EXPERIMENTAL INVESTIGATION OF ADVANCED SUPERCONDUCTING MAGNETS ANNUAL REPORT.
by E. Hoag. Jul 66, 87p NASA-CR-77307
Contract NAS8-5279

Descriptors: Advance, Boiling, Composite, Conductor, Current, Distribution, *Electromagnetism, Heat transfer, Helium, Liquid, Magnet, Niobium, *Superconducting magnet, *Superconductor, Transformer, Zirconium.

For abstract, see S 04 20.

PB-170 710 **Field 20C, 14B**
CFSTI Prices: HC$1.60 MF$0.50
State Inst. for Technical Research, Helsinki (Finland). Lab. of Technical Physics.
MEASURING PERMANENT MAGNET MATERIALS BY YOKE METHODS.
by Jukka Pesonen. 1966, 18p
Pub. in Acta Polytechnica Scandinavica, Physics including Nucleonics Series No. 37, Helsinki 1966.

Descriptors: (*Magnets, Test methods), Coils, Hall effect, Inductance, Magnetic fields, Hysteresis, Recording systems, Finland.

A survey is given of the general yoke methods applied in the testing of permanent magnet materials, along with a description of a simple device, incorporating a standard laboratory magnet and two hall elements, which automatically records hysteresis loops of highly coercive materials. (Author)

PB-172 459 **Field 20C**
CFSTI Prices: HC$4.60 MF$0.50
Unified Science Associates, Inc., Pasadena, Calif.
STABLE DENSE COLD PLASMA.
Semiannual technical summary rept., 20 Feb 61-19 Aug 64.
by S. Naiditch. 19 Aug 64, 41p
Contract Nonr-3437 (00), ARPA Order-194
AD-449 522

Descriptors: (*Hall effect, Measurement), (*Plasma medium, Simulation), Stability, Density, Sodium, Ammonia, Liquids, Conductivity.

Identifiers: Metal-ammonia solutions.

The major efforts were directed toward (1) validating our electrodeless Hall measurement technique, (2) measuring densities of liquid sodium ammonia solutions from -60 to +60C, (3) studying the conductivities of Na-NH3 solutions, and (4) improving our solution preparation techniques to enable us to increase lifetimes at elevated temperatures or attainment of higher temperatures. (Author)

AD-639 469 **See Field 20L**

AD-639 487 **See Field 12A**

AD-639 575 **See Field 11I**

20D. FLUID MECHANICS

AD-457 270 **Field 20D**
CFSTI Prices: HC$1.60
Royal Aircraft Establishment, Farnborough (England).
CALCULATIONS FOR THE DESIGN OF NOZZLES.
Technical rept.
by K. N. Dodd, B. A. M. Piggott, and B. P. Day. Oct 64, 15p TR-64021

Descriptors: (*Rocket motor nozzles, Aerospace craft), Axially symmetric flow, Attitude control systems, Design, Boundary layer, Numerical analysis, Configuration.

Details are given of the numerical procedures required in the design of an axially-symmetric nozzle. A velocity distribution along the axis of symmetry is assumed to be given and from this, a characteristic network is used to determine the isentropic core boundary after which a boundary layer calculation gives the shape of the nozzle itself. (Author)

AD-638 727 **Field 20D**
CFSTI Prices: HC$2.00 MF$0.50
Massachusetts Inst. of Tech., Cambridge. Aeroelastic and Structures Research Lab.
BOUNDARY-LAYER OSCILLATIONS OVER A RESONANT SURFACE.
by Peter B. Rhines, and Erik L. Mollo-Christen-

sen. Feb 66. 46p ASRL-TR-116-2
Contract Nonr-1841 (89)
Proj. RR-009-01-01

Descriptors: (*Boundary layer, *Oscillation), Surfaces, Resonance, Walls, Acoustics, Flexible structures, Turbulence, Shear stresses, Aeroelasticity.

The boundary layer is observed in low-speed flow over a dispersively-coupled system of acoustic resonators. It is found that oscillations in the laminar layer are strongly excited by this model of a passive, flexible, wall. The 'geometry' of this process differs from that expected with a real membrane, however, due to the details of the wall construction. A different set of laminar oscillations dominates the flow over the middle of the surface, producing turbulence in a manner controlled by the panwise variations in the wall. The importance of the nature of this transition process to other shearing flows is discussed. (Author)

AD-638 728 **Field 20D**
CFSTI Prices: HC$4.00 MF$1.00
Massachusetts Inst. of Tech., Cambridge. Aeroelastic and Structures Research Lab.
AN EXPERIMENTAL INVESTIGATION OF THE GENERATION OF WATER WAVES BY AIR SHEAR FLOWS.
by Ashok Kumar Gupta. Jun 66, 142p ASRL-TR-116-3
Contract Nonr-1841 (89)
Proj. RR-009-01-01

Descriptors: (*Water waves, Production), Fluid mechanics, Gas flow, Air, Wind, Laminar boundary layer, Velocity, Boundary layer, Surfaces.

A tank of length 46 in., width 12 in., and depth 5 1/4 in., tipped with a 4 1/2 in. long aluminum plate was filled with ordinary tap water and was placed parallel with a uniform air stream of low turbulence. Visual observations of the water free surface were made in the air speed range of 2 FPS to 26 FPS. (1) Allowing for the effects of slightly accelerating air flow and the finite length of the tank, the measured mean velocity profiles of the laminar air boundary layer agree in all essential aspects with Lock's velocity profile computed for zero pressure gradient. (2) Water wave generation by wind with laminar boundary layers consists of two phenomena: maintenance of water wave and initiation of water wave. A relatively low air speed can maintain a relatively long water wave but cannot initiate it. For the laminar boundary layer water waves of wavelengths 2 to 3 cm first appear at air speeds of 530 to 595 cm/sec. For the turbulent boundary layer the water waves first appear at air speeds of 350-400 cm/sec. (3) For air speeds greater than 23 FPS with the boundary layer laminar a Kel. Helm. type instability seems to occur. (4) Customary plots of neutral oscillations of Tollmien Schlichting waves modified by the water surface made for air speeds of 11.3, 17.5 and 20.6 FPS suggest a destabilising effect of the water surface.

AD-638 731 **Field 20D, 20M**
CFSTI Prices: HC$4.00 MF$0.75
Applicazioni e Ricerche Scientifiche S.p.A., Naples (Italy).
RESEARCH ON THERMODYNAMICS AND DYNAMICS OF GAS MIXTURES WITH TWO RATE PROCESSES.
Interim rept.
by R. Monti. 1965, 116p
Contract Nonr-4544 (00)
See also PB-148 581.

Descriptors: (*Gas flow, *Thermodynamics), Dynamics, Specific heat, Nozzle gas flow, Entropy, Velocity, Reaction kinetics, Italy.

Part I recalls the findings of previous work, in general doubly reacting gas mixtures, and outlines the procedure to be followed in Part II and III. Part II develops a model for a two biatomic gases mixture, the first gas may vibrate in non-equilibrium and the second gas may dissociate in non-equilibrium. State equations, stability matrix, characteristic speeds, specific heats are given as functions of the thermodynamic variables chosen for the analysis. Part III develops a model of a single biatomic gas which may vibrate and dissociate in non-equilibrium, again all the expressions of the thermodynamics functions are given. In Part IV, a thermokinetic model for the mixtures considered in Part III is developed: the rate processes and the kinetic matrix are derived, and the range of validity of the linearized equations and the effect of coupling are investigated in detail. The last part considers applications of the model developed in Parts III and IV to the nozzle flow problem and a sample calculation developed by numerical methods is reported. (Author)

AD-638 791 **Field 20D**
CFSTI Prices: HC$1.00 MF$0.50
Naval Ordnance Lab., White Oak, Md.
MEASUREMENTS OF THE STATIC PRESSURE DISTRIBUTIONS AND SHOCK SHAPE ON AN OBLATE SPHEROID AT MACH NUMBERS OF 3 AND 6.
by Lionel Pasiuk. 5 Jul 66, 23p NOLTR-66-138, Aerodynamics Research-265
Proj. NOL-936/ONR

Descriptors: (*Spheres, *Hypersonic characteristics), Pressure, Distribution, Supersonic flow, Reentry vehicles, Shock waves, Bodies of revolution.

The results of experimental measurements of the static pressure distribution and bow shock shape on an oblate spheroid are presented. This experiment was conducted at nominal Mach numbers of 3 and 6 and a free stream Reynolds number range of 2,300,000 to 5,800,000 per foot. Comparisons are made with the calculated values of several different laboratories. (Author)

AD-638 795 **Field 20D**
CFSTI Prices: HC$3.00 MF$0.75
Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.
MEASUREMENT OF THE VELOCITY DISTRIBUTION FUNCTION OF A GAS USING A LASER.
Technical rept.
by Krishnamurty Karamcheti, Sotiris P. Koutsoyannis, Munson A. Kwok, and Maurice L. Rasmussen. May 66, 78p TR-1, SUDAAR-275
Contract Nonr-225 (61)
Proj. NR-061-129

Descriptors: (*Gases, Atomic spectroscopy), (*Kinetic theory, Distribution functions), Lasers, Velocity, Measurement, Attenuation, Theory.

The problems associated with the measurement of the velocity distribution function of a gas using a laser are presented and discussed. A simple theoretical model relating the frequency variation of the absorption coefficient across a spectral line of a gas to the distribution function of velocities in the direction of propagation of a plane monochromatic wave is developed and applied to measurements of attenuation of a laser beam passing through the gas. Experimental results with a D.C. excited Neon gas and a He-Ne laser oscillating at 6328.2 A show that under certain experimental conditions agreement with theory is good. (Author)

AD-638 804 **Field 20D**
CFSTI Prices: HC$3.00 MF$0.75
Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
FLOW FIELD AND SURFACE PRESSURE MEASUREMENTS IN THE FULLY MERGED AND TRANSITION FLOW REGIMES ON A COOLED SHARP FLAT PLATE.
Rept., for Oct 64-Dec 65.
by Manfred Becker, and David E. Boylan. Sep 66, 60p AEDC-TR-66-111
Contract AF 40 (600)-1200
Proj. AF-8953
Task 895306
Prepared in cooperation with ARO, Inc., Arnold Air Force Station, Tullahoma, Tenn. Prepared for presentation at the International Symposium on Rarefied Gas Dynamics (5th), Oxford (England), 4-8 Jul 66.

Descriptors: (*Flat plate models, *Hypersonic characteristics), Flow fields, Leading edge, Pressure, Anemometers.

The experimental survey of the flow field near the leading edge of a cooled, sharp flat plate parallel to a hypersonic stream of low density is discussed. Results consisting of impact pressure and hot-wire anemometer profiles plus surface pressures are analyzed and compared to recent theoretical results. Data are presented for viscous interaction parameters as high as 2.0. (Author)

AD-638 831 **Field 20D**
Not available from CFSTI.
New York Univ., N. Y.
SOME REMARKS ON PERTURBATION SOLUTIONS IN LAMINAR BOUNDARY THEORY.
by Herbert Fox, and Shun Chen. 20 Sep 65, 12p
Contract AF 33 (615)-2215
Proj. AF-7064
ARL-66-0123
Availability: Published in J. Fluid Mech. v25 pt1 p199-205 1966.

Descriptors: (*Perturbation theory, *Laminar boundary layer), Fluid mechanics.

A procedure is introduced to extend the usefulness of some perturbation solutions previously presented by Libby and Fox (1963) and Fox and Libby (1964). The perturbations are now formulated about a Blasius solution with an unknown origin. This origin, an additional degree of freedom, is selected, in the spirit of local similarity, so that it will yield a better approximation to the initial profile. With this modification the basic solution will handle a much wider class of problems successfully. Numerical examples are presented to demonstrate the improved accuracy and applicability of this new scheme. (Author)

AD-638 839 **Field 20D**
Not available from CFSTI.
Cincinnati Univ., Ohio.
NOTE ON THE SOLUTION OF THE FORCE OF SLENDER DELTA WINGS.
Revised ed.
by Arnold Polak. 15 Nov 65, 7p
Contract AF 33 (616)-8453
Proj. AF-7064
ARL-66-0129
Revision of manuscript submitted 30 Jul 65.
Availability: Published in AIAA Journal v4 n3 p556-8 Mar 1966.

Descriptors: (*Delta wings, Pressure), Distribution, Slender bodies, Shock waves, Angle of attack, Thickness, Force (Mechanics), Mathematical analysis.

In a paper published recently (AD-618 252), Hida presents an inverse method to evaluate the pressure distribution over a slender delta wing, with consideration of the thickness effect. The shock is detached and the angle of attack is moderate. This paper elaborates upon the method.

AD-638 842 **Field 20D, 20K**
Not available from CFSTI.
Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
OSCILLATORY PRESSURES IN AN IDEALIZED BOUNDARY LAYER WITH APPLICATION TO CYLINDER FLUTTER.
Revised ed.
by William J. Anderson. 4 Feb 66, 12p ARL-66-0136

Proj. AF-7063
Revision of manuscript submitted 22 Sep 65. Prepared for presentation at AIAA Sym. on Structural Dynamics and Aeroelasticity, Boston, Mass. 30 Aug-1 Sep 65.
Availability: Published in AIAA Journal v4 n5 p865-72 May 1966.

Descriptors: (*Cylindrical bodies, *Flutter), (*Boundary layer, Oscillation), Panels (Structural), Supersonic flow, Aerodynamic characteristics, Subsonic flow, Pressure.

A theory is presented for the panel flutter of a thin-walled circular cylinder. The flow is supersonic and is parallel to the cylinder axis. Aerodynamic forces are developed for an infinitely long cylinder oscillating in a sinusoidal wall deflection. The boundary layer is idealized as an annular region of uniform, parallel, subsonic flow surrounding the shell. The boundary layer profile is therefore discontinuous, in the form of a step function. Perturbations due to wall oscillations are assumed to be small so that the flows in the subsonic and supersonic regions are isentropic and irrotational. It is found that the idealized boundary layer has a significant effect on the amplitudes and phase angles of the pressure distribution on the shell. Flutter calculations are carried out for a cylinder of finite length fluttering in a mode with many circumferential waves. The boundary layer has a strongly stabilizing effect for this type of flutter. (Author)

AD-638 859 **Field 20D, 12A**
CFSTI Prices: HC$2.00 MF$0.50
Drexel Inst. of Tech., Philadelphia, Pa.
SOLUTION OF BLAST WAVES BY A CONSTANT TIME SCHEME IN THE METHOD OF CHARACTERISTICS.
Technical rept.
by Shih Lien Huang, and Pei Chi Chou. Aug 66, 39p Rept. no. 125-9
Contract DA-18-001-AMC-876 (X)

Descriptors: (*Numerical methods and procedures, *Shock waves), Blast, Errors, Fluid mechanics.

The numerical method of characteristics with constant time grids is applied to the plane blast wave problem. The calculation begins at a constant time line bounded by the shock front and a fixed back boundary which lies halfway between the shock front and the time axis. Along the initial time line, all three flow variables are prescribed and on the back boundary, the local flow velocity is prescribed. The prescribed values are calculated from the similarity solution. For the shock front, the strong shock equations are applied. When compared to the exact similarity solution, the results of this method are found to be accurate to within .5% for all variables throughout the region of calculation, after a pressure drop of 98%. Both h2-type and h-type extrapolations of calculated results improve the accuracy; however, h-type extrapolation is more favorable. The effects on the domain of dependence and range of influence are studied briefly. (Author)

AD-638 965 **Field 20D, 1A**
Not available from CFSTI.
Massachusetts Inst. of Tech. Cambridge.
THEORETICAL CONSIDERATIONS OF PANEL FLUTTER AT HIGH SUPERSONIC MACH NUMBERS.
Revised ed.
by John Dugundji. 28 Mar 66, 10p
Contract AF 49 (638)-1528
Proj. AF-9782
Task 978201
AFOSR-66-1803
Revision of manuscript submitted 15 Nov 65.
Availability: Published in AIAA Journal v4 n7 p1257-66 Jul 1966.

Descriptors: (*Flutter, *Superaerodynamics), Airplane panels, Aeroelasticity, Supersonic characteristics.

The general characteristics of panel flutter at high supersonic Mach numbers are examined theoretically. Linear plate theory and two-dimensional first-order aerodynamics are used. The paper attempts to clarify the important role of damping, he relationship between traveling and standing wave theories of panel flutter, and the effects of edge conditions. The solution procedures and genral mathematical behavior may be of interest in other stability problems characterized by the appearance of complex eigenvalues. (Author)

AD-639 130 **Field 20D**
CFSTI Prices: HC$2.00 MF$0.50
RAND Corp., Santa Monica, Calif.
THE INCOMPRESSIBLE LAMINAR AXISYMMETRIC WAKE.
by S. A. Berger. Aug 66, 41p RM-4860-ARPA
Contract SD-79, ARPA Order-189-1

Descriptors: (*Wake, *Cylindrical bodies), Incompressible flow, Axially symmetric flow, Slender bodies, Mathematical analysis, Two-dimensional flow.

The memorandum considers the asymptotic development of the axisymmetric incompressible wake far behind a long, thin cylinder. This is the axisymmetric analogue of the classical two-dimensional flat-plate problem; however, the resulting solution is applicable to a wider class of axisymmetric bodies. In Section II an asymptotic expansion in inverse powers of the axial distance downstream of the cylinder is attempted. In Section III the axisymmetric problem is reformulated, and it is hown that as in the two-dimensional problem the cause of the breakdown of the solution given in Section II is the existence of a logarithmic term in the second-order approximation.

AD-639 131 **Field 20D**
CFSTI Prices: HC$1.00 MF$0.50
RAND Corp., Santa Monica, Calif.
THE APPLICATION OF THE PLK METHOD TO THE INCOMPRESSIBLE LAMINAR AXISYMMETRIC FAR WAKE.
by S. A. Berger. Aug 66, 18p RM-4859-ARPA
Contract SD-79, ARPA Order-189-1

Descriptors: (*Wake, *Cylindrical bodies), Laminar flow, Incompressible flow, Axially symmetric flow, Boundary value problems, Approximation (Mathematics), Asymptotic series.

Identifiers: PLK method.

An attempted asymptotic series solution in terms of inverse powers of the axial distance for the incompressible laminar wake far behind a very slender cylinder breaks down at an early stage. The PLK method is applied to the problem and yields a uniformly valid asymptotic solution. The method of approach used should be of interest to researchers in fluid mechanics concerned with the solution of singular perturbation problems, while the results should be of interest to those involved in wake studies. (Author)

AD-639 147 **Field 20D**
CFSTI Prices: HC$1.00 MF$0.50
Department of the Navy, Washington, D. C.
STATE OF GAS BEHIND FRONT OF A STRONG SHOCKWAVE.
by L. M. Biberman, and I. T. Yakubov. 17 Aug 66, 19p Trans-2172
TT-66-60531
Sostoianie Gaza za Frontom Silnoi Udarnoi Volny, trans. of Teplofizika Vysokikh Temperatur (USSR) v3 n3 p340-53 1965.

Descriptors: (*Shock waves, Gas flow), Atomic energy levels, Approximation (Mathematics), Velocity, USSR.

An appropriate system of the equations is recorded and an approximate method of its solution is proposed that takes into account the role of the excited states. In particular, shock waves in air at velocities v1 > or = 10 km/sec are examined.

AD-639 155 **Field 20D**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
METHOD OF DETERMINING THE AERODYNAMIC CHARACTERISTICS OF BODIES IN A FREE-MOLECULAR FLOW.
by L. A. Vasilev, and L. I. Travnikova. 28 Jun 66, 6p FTD-TT-65-1935
Unedited rough draft trans. of Patent (USSR) 168 030, appl. 886744/40-23, 12 Mar 64.

Descriptors: (*Superaerodynamics, *Aerodynamic characteristics), Aerodynamic configurations, Patents, USSR.

A model of the body is radiated by light flux from a little aperture and one measures the indicatrix of the dispersion of the light by the surface of the model while simultaneously selecting the surface of the model in such a way that the characteristics of the reflection of the light from it would be the same as the characteristics of the reflection of the molecules of the medium in which the body is flying. (Author)

AD-639 157 **Field 20D, 14B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
ANEMOMETER FOR MEASURING LOW RATES OF GAS FLOW.
by G. G. Belov. 28 Jun 66, 6p FTD-TT-65-1940
Unedited rough draft trans. of Patent (USSR) 168 949, appl. 891020/26-10 26 Mar 64.

Descriptors: (*Anemometers, *Gas flow), Design, Patents, USSR.

The anemometer contains a wind wheel, together with a contactless (for example, photoelectric) system of registering rates of flow. For improving the sensitivity of the anemometer, and also assuring the continuity and stability of the measurements, the anemometer is provided with an electric motor, with a system of permanent magnets located on its shaft, with a metallic disk located in the field of these magnets and fastened on the axis of the wind wheel. (Author)

AD-639 159 **Field 20D**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
COMPUTATION OF THE TRAJECTORY OF A JET IN A DRIFTING FLOW.
by S. V. Vakhlamov. 13 Jun 66, 12p FTD-TT-65-1977
TT-66-62285
Unedited rough draft trans. of InzhenernoFizicheskii Zhurnal (USSR) v7 n10 p112-6 1964.

Descriptors: (*Jets, Trajectories), Drift, Gas flow, Equations of motion, USSR.

A method is expounded for computing the trajectory of a jet in a lateral flow based on the application of the equation of the amount of motion in projections onto the axes of coordinates. (Author)

AD-639 207 **Field 20D**
CFSTI Prices: HC$1.00 MF$0.50
Cold Regions Research and Engineering Lab., Hanover, N. H.
VERIFICATION OF THE PROPOSED EQUATION FOR CALCULATION OF THE FORCES ON A SPHERE ACCELERATING IN A VISCOUS FLUID.
Research rept.
by Fuat Odar. Jul 66, 25p RR-190
Task 1V014501B52A02

Descriptors: (*Force (Mechanics), *Spheres), Equations of motion, Fluids, Viscosity, Acceleration, Velocity, Simulation, Particles.

An equation proposed for the calculation of forces on a sphere accelerating in a viscous fluid (Odar and Hamilton, 1964 AD-602 777) is verified by comparing the velocities of spheres falling under gravity in a viscous fluid with those calculated from the equation. The excellent agreement between the experimental and calculated values suggests wide application for the equation. (Author)

AD-639 217 Field 20D
CFSTI Prices: HC$7.00 MF$1.75
Michigan Univ., Ann Arbor.
BOUNDARY LAYER ANALYSIS OF TWO-PHASE (LIQUID-GAS) FLOW OVER A CIRCULAR CYLINDER AND OSCILLATING FLAT PLATE.
Scientific rept.
by M. E. Goldstein, Wen-Jei Yang, and J. A. Clark. 1966. 363p
Contract AF 33 (657)-8368
Proj. AF-7063
ARL-66-0010-Pt-4
See also AD-635 706, AD-636 252, AD-636 924.

Descriptors: (*Cylindrical bodies, Boundary layer), (*Sheets, Boundary layer), (*Two-phase flow, Boundary layer), Heat transfer, Skin friction, Air, Water, Drops, Films, Fluid flow, Liquids, Two-dimensional flow, Partial differential equations, Differential equations, Oscillation.

Flow is assumed two dimensional, and gravity, vaporization of the liquid phase, and compressibility are ignored. The liquid is assumed to be in the form of small drops far upstream from the body. The liquid film which forms on the surface of the body due to drop impingement is analyzed extensively. In the case of the cylinder the analysis is started from the full incompressible Navier-Stokes and energy equations in the film which are simplified by using dimensional arguments. For the flat plate the boundary layer approximations are assumed to hold a priori in the film. Solutions to the governing equations and boundary conditions are carried out by a series expansion technique which results in a series of ordinary differential equations which have been solved numerically on a 7090 computer. The solutions are used to calculate velocity and temperature profiles in the film and also such physical quantities as local film thickness, local Nusselt Number, and local skin friction. The analysis shows that in general there is a significant increase in heat transfer as well as skin friction over what would be obtained from a single component gas flow. In the case of the flat plate only a very small permanent change in the heat transfer was found due to the oscillations. In the case of the cylinder a peaking in the heat transfer, film thickness and skin friction was found with respect to the parameter E squared (the product of the volume fraction of the liquid in the free stream, squared, and the diameter Reynolds number based on liquid properties).

AD-639 242 Field 20D
CFSTI Prices: HC$2.00 MF$0.50
Boeing Scientific Research Labs., Seattle, Wash. Flight Sciences Lab.
THE TWO-DIMENSIONAL FLOW OF AN INVISCID DENSITY-STRATIFIED LIQUID PAST A SLENDER BODY.
by E. W. Graham. Jul 66, 32p D1-82-0550, Flight Sciences Lab-108

Descriptors: (*Slender bodies, *Two-dimensional flow), Equations of motion, Mathematical analysis.

Under the assumption of small velocity perturbations the linearized equation governing the two-dimensional flow of a density-stratified fluid is developed. The density is assumed to vary exponentially with depth which simplifies the equations and permits consideration of a fluid of infinite extent vertically as well as horizontally. The approximate derivation used emphasizes the physical aspects of the situation, employing the eccentricity of the center of gravity of a fluid element and the resulting torque which is developed even in the absence of viscosity. Particular attention is given to the case where gravity forces greatly exceed accelerative forces. For this case the expression for a dipole is developed and corrected to eliminate infinite energy from the upstream field. It is shown how the dipole is used to construct slender bodies, and expressions for the wave drag of slender bodies are given. The attempt is to further clarify some of the simpler aspects of stratified-fluid flow. (Author)

AD-639 308 Field 20D, 14B
CFSTI Prices: HC$3.00 MF$0.50
Ohio State Univ., Columbus. Aeronautical and Astronautical Research Lab.
AXISYMMETRIC AND PLANAR FREE JETS FOR HYPERSONIC LOW DENSITY TEST FACILITIES.
Technical rept. no. 3, 1 Apr 64-15 Nov 65.
by G. M. Gregorek, and R. G. Luce. Apr 66, 53p
Contract AF 33 (657)-11060
Proj. AF-7065
ARL-66-0068

Descriptors: (*Hypersonic flow, Jets), (*Test facilities, Hypersonic flow), Axially symmetric flow, Density, Orifices, Superaerodynamics.

The use of axisymmetric and planar free jets to generate hypersonic, low density flow was investigated, and design criteria for producing these flows established. Method of characteristics solutions defining the stream gradients for these flows were verified by pitot pressure surveys and an analytic prediction of Mach disc location was verified by schlieren photography. The experiments indicate that the undesirable high stream gradients of the sonic exit, axisymmetric free jets may be reduced by using short conical extensions to produce jets expanded from Mach numbers greater than unity. A free jet formed by an M = 2 orifice showed both a decrease in stream gradients and an increase in test area caused by an aft movement of the Mach disc. An adverse influence of the Mach disc on a sphere model pressure distribution and shock shape was found when the model, of the same diameter as the orifice, was less than eight diameters upstream of the disc. The planar flows generated by shots showed a substantial reduction in stream gradients when compared with the axisymmetric jets. Full development of the planar flow was not achieved, even with slots of length to height ratio of 200, because of a strong shock system emanating from the ends of the slot. These oblique shocks terminated the isentropic expansion. (Author)

AD-639 325 Field 20D
CFSTI Prices: HC$6.00 MF$1.25
IIT Research Inst., Chicago, Ill.
INVESTIGATION OF SWIRLING FLOWS IN DUCTS.
Final rept.
by Z. Lavin, and A. A. Fejer. May 66, 239p M6117
Contract AF 33 (615)-2122
Proj. AF-7116
ARL-66-0083

Descriptors: (*Vortices, *Ducts), Cylindrical bodies, Incompressible flow, Laminar flow, Fluid dynamic properties, Stability.

The work reports on theoretical and experimental investigations of swirling flows in cylindrical ducts. Steady state solutions were obtained for laminar incompressible swirling flow in the entrance region of a straight circular duct of uniform cross section by solving the complete Navier Stokes equations using the stream function, the angular momentum and the tangential component of vorticity as variables. The analysis was also adapted to the solution of unsteady flows and as an example, an impulsively started flow was treated. In addition, a method was suggested for the study of the hydrodynamic stability of laminar swirling flows. Finally it was demonstrated that for the flows under consideration the analytical incompressible solutions are also representative of the characteristics of swirling compressible flows. In the experimental part of the investigation, a swirling flow of air was observed in a thirty-inch long, three-inch diameter duct. (Author)

AD-639 330 Field 20D
CFSTI Prices: HC$2.00 MF$0.50
Polytechnic Inst. of Brooklyn, Freeport, N. Y.
APPLICATION OF LINEARIZED CHARACTERISTICS TO A THREE-DIMENSIONAL NOZZLE FLOW.
Interim rept.
by Arthur J. Schlesinger. Jun 66, 32p PIBAL-866
Contract AF 33 (657)-8286
Proj. AF-7065
ARL-66-0107

Descriptors: (*Nozzle gas flow, Three-dimensional flow), (*Supersonic nozzles, Design), Linear systems, Equations.

The method of three-dimensional linearized characteristics was applied to the design of annular supersonic nozzles. The equations and coordinate system used are presented along with a step-by-step calculation procedure of the method. A typical nozzle was designed which produces a radial variation in the exit Mach number and flow deflection. The results are presented in terms of the two-dimensional and final three-dimensional nozzle contours in three radial planes. The method and system of equations presented are applicable to guide vanes or stators with large turning angles and high tangential components of velocity. (Author)

AD-639 337 Field 20D, 20K
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
JOURNAL OF ENGINEERING: 1964, VOL. 4, NO. 3. (SELECTED ARTICLES).
by L. M. Simuni, M. P. Sheremetev, and B. L. Peleks. 21 Jun 66, 21p FTD-TT-65-1982
TT-66-62317
Unedited rough draft trans. of Inzhenernyi Zhurnal (USSR), v4 n3 p446-50, 504-9 1964.

Descriptors: (*Fluid flow, Partial differential equations), (*Theory, Deformation), Bending, Viscosity, Numerical methods and procedures, Metal plates, Beams (Structural), Stresses, Elasticity.

Contents: Numerical solution of certain problems in the flow of viscous fluids, by L. M. Simuni; On the derivation of a refined theory of plates, by M. P. Sheremet'yev and B. L. Peleks.

AD-639 351 Field 20D
Not available from CFSTI.
General Dynamics Corp., San Diego, Calif. General Atomic DIV.
TAYLOR INSTABILITY IN A VISCOUS LIQUID.
by John W. Miles, and John K. Dienes. 21 Jul 66, 6p GA-7253
Contract AF 29 (601)-7155
Availability: Published in Physics of Fluids p2-5.

Descriptors: (*Liquids, Stability), Equations of motion, Viscosity, Mathematical analysis, Surface tension.

Identifiers: Taylor instability.

An approximate formulation, based on the hypothesis of irrotational flow, gives a satisfactory estimate of the growth rate for Taylor instability, at least for non-small kh.

AD-639 382 Field 20D
CFSTI Prices: HC$3.00 MF$0.75
Princeton Univ., N. J. Gas Dynamics Lab.
ON HYPERSONIC VISCOUS FLOW NEAR A SHARP LEADING EDGE.

Interim rept.
by Richard W. Garvine. Jun 66, 79p Rept. no. 755
Contract AF 49 (638)-1271, Grant AF-EOAR-112-63
Proj. AF-7064
ARL-66-0102
Research supported in part by NSF, Grant NSF-GP-579.

Descriptors: (*Hypersonic flow, *Leading edge), Viscosity, Differential equations, Boundary layer.

Theoretical inquiry is made into the high speed viscous flow past a sharp-edged flat plate whose surface is aligned with the oncoming flow. Basic information is sought concerning the fundamental nature of the flow field in regions near the leading edge. The role of upstream conditions is found to be fundamental. Study is made of the viscous layer region on the two-dimensional flat plate ahead of the strong interaction region. The Navier-Stokes equations are applied to the flow up to the point where continuum treatments are no longer justifiable. Two initial velocity profiles were assumed in order to examine the details of the theory. Neither form proved to yield realistic flow fields in the light of experimental results. Computations from these two profile forms, however, did serve to bring out the sensitivity of the flow throughout the viscous layer region to initial conditions. It is concluded, in consequence, that the flow cannot be described by similar solutions or other solutions which ignore these initial values. (Author)

AD-639 407 **Field 20D**
Not available from CFSTI.
Michigan Univ., Ann Arbor. Dept. of Engineering Mechanics.
NOTE ON EDGE WAVES IN A STRATIFIED FLUID.
Revised ed.
by Chia-shun Yih. 4 Oct 65, 3p
Grant DA-ARO (D)-31-124-G717
AROD-3688:1
Revision of manuscript submitted 25 Jan 65.
Availability: Published in J. Fluid Mech. v24 pt4 p765-7 1966.

Descriptors: (*Water waves, Propagation), Transformations (Mathematics), Liquids.

Identifiers: Stratified media.

The solution given by Gerstner for water waves of finite amplitude, which is valid for a semi-infinite liquid of arbitrary stratification, is reconsidered. By a transformation of co-ordinates, it is shown to represent edge waves propagating along a sloping shore. (Author)

AD-639 444 **Field 20D**
CFSTI Prices: HC$5.00 MF$1.00
Michigan Univ., Ann Arbor.
AN EXPERIMENTAL STUDY OF THE INFLUENCE OF LOCALIZED, NORMAL SURFACE OSCILLATIONS ON THE LAMINAR FLOW OVER A FLAT PLATE.
Final rept.
by James M. Deimen, and John A. Clark. Jan 66, 152p
Contract AF 33 (657)-8368
Proj. AF-7063
ARL-66-0010-Pt-6

Descriptors: (*Flat plate models, *Laminar flow), Oscillation, Surface properties, Membranes, Wind tunnels, Anemometers, Velocity.

The purpose of the investigation is to study the effect of a finite localized surface oscillation on the mean value velocity profiles in the laminar boundary layer of a flat plate and compare the results with an analytic solution. The experimental program consisted of the design, construction and testing of a flat plate with a flexible membrane located in the surface and driven by an oscillating device. The flat plate was located in a low turbulence, low speed wind tunnel. The principal measuring instrument was a hot wire anemometer. Experimental data was taken at free stream velocities of 20 and 40 feet per second. The surface oscillation amplitude was 0.050 inches and the frequency range 15 to 100 cycles per second. The results of the investigation show that a definite change in the mean value velocity profile in laminar flow occurs and is a function of free stream velocity, frequency and location on the plate surface. In addition, early transition is promoted despite the fact that the disturbance test range was within the Tollmien-Schlichting stability area. The analytic solution is found to be qualitatively valid in the laminar flow region downstream of the membrane. (Author)

AD-639 451 **Field 20D**
Not available from CFSTI.
Hebrew Univ., Jerusalem (Israel). Dept. of Physics.
ON THE MOTION OF A SHOCK WAVE ALONG CONVERGING OR DIVERGING DUCTS.
by M. Dvir, W. Low, S. Maniv, and J. Stricker.
16 Jan 66, 6p
Contract AF 61 (052)-846
Proj. AF-9783
Task 978302
AFOSR-66-1368
Availability: Published in Israel Journal of Technology v4 n1 p96-8 1966.

Descriptors: (*Shock waves, Ducts), Convergent divergent nozzles, Attenuation, Shock tubes, Israel.

The shock speed behind convergent and divergent channels was measured for different pressures P sub 4 and P sub 1, and for different taper angles a. When these data are corrected for the attenuation caused by the viscous effects in a straight shock tube it is found that the values far downstream approach those predicted by the steady state theory. Near the exit of the nozzle the average Mach speed is that given by the linear theory. Superimposed are large fluctuations of the Mach speed, in particular close to the exit of the nozzle. It is believed that the maxima and minima of the values in M sub D arise from interference effects of the transmitted and rereflected shocks. Evidence for the existence of such different shock waves was obtained from the time dependence of the microwave attenuation. (Author)

AD-639 592 **Field 20D**
CFSTI Prices: HC$4.00 MF$0.75
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
ELECTRON BEAM STUDIES OF THE DIFFUSIVE SEPARATION OF HELIUM-ARGON MIXTURES IN FREE JETS AND SHOCK WAVES.
by Dietmar E. Rothe. Jul 66, 115p UTIAS-114
Grants AF-AFOSR-276-65, DRB-9551-02

Descriptors: (*Helium, Diffusion), (*Argon, Diffusion), Electron beams, Densitometers, Mixtures, Jets, Shock waves, Separation, Density, Canada.

A narrow electron beam was used to selectively determine the component densities in rarefied helium-argon flows by spectrally analyzing the beam's luminescence. After a systematic study of the electron beam fluorescence in helium and argon was made in a series of preliminary experiments, point-by-point measurements were made along and off the axes of underexpanded free jets and through normal shock waves produced by shock holders placed in the jets. Various argon mole fractions were used, and the jet Reynolds numbers ranged from 100 to 10,000. The argon enrichment found along the jet axis agrees well with a theory recently proposed by F. S. Sherman. Off axis tests show an argon deficiency near the jet boundary. The experimental shock profiles agree only qualitatively with one-dimensional theories. Radial diffusion destroyed the otherwise approximate one-dimensionality of the shock waves, resulting in a significant argon enrichment inside the partially stagnated shock holder. (Author)

N66-23898 **Field 20D**
CFSTI Prices HC$3.60 MF$0.50
Von Karman Inst. For Fluid Dynamics, Rhode Saint-genese (Belgium).
LAMINAR SEPARATION IN SUPERSONIC AND HYPERSONIC FLOWS FINAL REPORT 1 NOV. 1964 - 31 OCT. 1965.
by J. J. Ginoux. Oct 65, 32p AFOSR-65-2715, AD-628182
Contract AF-EOAR-65-11

Descriptors: *Aerodynamic heating, Aerodynamics, Boundary, Edge, Flow, Heat transfer, Heating, Hypersonic, *Hypersonic flow, Laminar, *Laminar boundary layer separation, Layer, Leading, Separation, Supersonic, *Supersonic flow, Sweepback, *Sweptback wing, Wing.

For abstract, see S 04 13.

N66-23936 **Field 20D**
CFSTI Prices HC$2.60 MF$0.50
Politecnico Di Torino (Italy).
THEORETICAL INVESTIGATIONS ON THE BOUNDARY LAYER WITH PRESSURE GRADIENT SCIENTIFIC REPORT NO. 8.
by E. Mattioli. Aug 65, 24p AFOSR-65-2736, AD-629212
Contract AF-EOAR-98-63
Its Tech. Note 32

Descriptors: Analysis, Boundary, *Boundary layer, Flat, *Flat plate, Flow, Fluid, Gradient, Incompressibility, *Incompressible flow, Layer, Model, Plate, Pressure, *Pressure gradient, Theory, Transition, Turbulence.

For abstract, see S 04 13.

N66-24323 **Field 20D**
CFSTI Prices HC$2.00 MF$0.50
Deutsche Versuchsanstalt Fur Luft- Und Raumfahrt, Berlin (West Germany).
BOUNDARY LAYERS AND WALL RADIATION AT STRONGLY CURVED WALLS (COANDA-EFFECT).
Grenzschichten Und Wandstrahlen An Stark Gekrummten Wanden (Coanda-effekt)
by H. Fernholz, and R. Wille. Feb 66, 41p DLR-FB-66-06, DVL-493
In German, English Summary

Descriptors: Application, Boundary, *Coanda effect, Curvature, Deflection, Dynamics, Flow, *Flow theory, Fluid, *Fluid mechanics, *Hydrodynamics, Jet, Layer, Mechanics, Practical, Theory, Wall.

For abstract, see S 04 13.

N66-24389 **Field 20D**
CFSTI Prices HC$1.25 MF$0.75
Northrop Corp., Newbury Park, Calif.
CALCULATION OF TWO-DIMENSIONAL TURBULENT FLOW FIELDS.
by W. E. Carr, W. J. Niles, R. L. Rentfrow, and J. G. Trulio. May 66, 84p NASA-CR-430
Contract NAS-11400

Descriptors: Calculation, Code, Compression, Computer, Dimension, Equation, Field, Flow, *Flow field, Fluid, Motion, *Navier-stokes equation, Numerical, Solution, Turbulent, *Turbulent flow, Two, *Two-dimensional flow, Viscous, *Viscous fluid.

For abstract, see S 04 13.

N66-24546 **Field 20D**
CFSTI Prices HC$3.00 MF$0.50
Fluidyne Engineering Corp., Minneapolis, Minn.

FLOW INITIATION STUDY FOR PROPOSED TUBE WIND TUNNEL, PHASE I. APPENDIX - RE-EVALUATION OF CANDIDATE SYSTEMS.
by J. L. Grunnet, W. B. Hamre, P. B. Hasselquist, D. N. Kamis, and G. H. Thornberg. Dec 65, 54p NASA-CR-74635
Contract NAS8-20214

Descriptors: Cost, Design, Evaluation, Flow, Initiation, Load, Nozzle, *Nozzle flow, Tube, Tunnel, *Valve, Wind, *Wind tunnel nozzle.

For abstract, see S 04 13.

N66-24838 **Field 20D, 1A**
CFSTI Prices HC$2.00 MF$0.75
Aerodynamische Versuchsanstalt, Gottingen (West Germany).
TWO GAS BOUNDARY LAYERS IN THE REGION OF FREE STAGNATION POINTS IN INCOMPRESSIBLE FLOW WITH REGARD TO THE THERMAL DIFFUSION.
Zweigasgrenzschichten In Der Umgebung Eines Freien Staupunktes In Inkompressibler Stromung Mit Berucksichtigung Der Thermischen Diffusion
by W. Wuest. 4 Nov 64, 48p REPT.-64-A-40
In German

Descriptors: Boundary, *Boundary layer flow, Cap, Ejection, Flow, Formation, Forward, Gas, Heat, Incompressible, *Incompressible flow, Insulation, Layer, Nose, *Nose cap, Orifice, Supersonic, *Supersonic heat transfer, Thermal, *Thermal insulation, Transfer.

For abstract, see S 04 13.

N66-24892 **Field 20D, 14B**
CFSTI Prices HC$2.00 MF$0.50
Institut Franco-allemand De Recherches, St. Louis (France).
DIFFRACTION OF A SHOCK WAVE UPON ENTERING A SUBTERRANEAN WIND TUNNEL, PART I.
Diffraction D'une Onde De Choc A L'entree D'une Galerie Souterraine, Iere Partie
by C. Laurent, and I. Thery. 30 Dec 64, 27p ISL-T-44/64
In French

Descriptors: Block, Blocking, Diffraction, Entrance, High pressure, Interferometer, Interior, Photograph, Propagation, Protection, Shock, *Shock wave, Wave, *Wave diffraction, *Wind tunnel.

For abstract, see S 04 13.

N66-24911 **Field 20D**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
REPRESENTATION OF THE EQUATION OF STATE OF A REAL GAS BY ELEMENTARY FUNCTIONS, AND METHODS OF THEIR DETERMINATION.
Predstavleniye Uravneniya Sostoyaniya Real'nogo Gaza Cherez Elementarnyye Funktsii I Metodika Ikh Opredeleniya
by YA. Z. Kazavchinskiy. Apr 66, 15p NASA-TT-F-10078
Transl. Into English From Inzh.-fiz. Zh. (Ussr), V. 7, No. 6, 1964 P 129-134

Descriptors: Curve, Density, Equation, Function, Gas, Linear, *Linear equation, Liquid, Nitrogen, Phase, Range, Real, *Real gas, Region, Saturation, State, *State equation, Temperature, Variation.

For abstract, see S 04 13.

N66-24912 **Field 20D**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
TURBULENT BOUNDARY LAYER ON A FLAT PLATE IN AN INCOMPRESSIBLE FLUID.
Turbulentnny Pogranichnyy Sloy Na Ploskoy Plastine V Neszhimayemoy Zhidkosti
by G. S. Glushko. Apr 66, 29p NASA-TT-F-10080
Transl. Into English From Izv. Akad. Nauk Sssr, Ser. Mekhan. (Moscow), No. 4, 1965 P 13-23

Descriptors: Boundary, Effectiveness, Energy, Equation, Flat, *Flat plate, Fluid, Function, Gradient, Incompressible, *Incompressible fluid, Independence, Layer, Plate, Pressure, *Pressure gradient, Reynolds number, Turbulent, *Turbulent boundary layer, *Viscosity.

For abstract, see S 04 13.

N66-24946 **Field 20D**
CFSTI Prices HC$4.00 MF$1.00
North American Aviation, Inc., Downey, Calif.
A STUDY OF LONGITUDINAL OSCILLATIONS OF PROPELLANT TANKS AND WAVE PROPAGATIONS IN FEED LINES. PART I - ONE-DIMENSIONAL WAVE PROPAGATION IN A FEED LINE.
by C. L. Tai, and H. Wing. 31 Mar 66, 126p NASA-CR-74739, SID-66-46-1
Contract NAS8-11490

Descriptors: Analysis, Engine, Flow, *Fuel system, Function, Hydrogen, Liquid, Numerical, Pressure, Propagation, *Propellant tank, Saturn s- ii stage, Shear, Stress, Transfer, Turbulent, Wave, *Wave propagation.

For abstract, see S 04 13.

N66-24947 **Field 20D**
CFSTI Prices HC$3.00 MF$0.50
North American Aviation, Inc., Downey, Calif.
A STUDY OF LONGITUDINAL OSCILLATIONS OF PROPELLANT TANKS AND WAVE PROPAGATIONS IN FEED LINES. PART II - WAVE PROPAGATION IN ELASTIC PIPE FILLED WITH INCOMPRESSIBLE VISCOUS FLUID.
by M. M. Loh, and C. L. Tai. 21 Jan 66, 55p NASA-CR-74740, SID-66-46-2
Contract NAS8-11490

Descriptors: Elastic, Equation, Feed, *Feed system, Fluid, Graph, Incompressible, *Incompressible fluid, Inertia, Liquid, *Liquid propellant, Pipe, Pressure, Propagation, Propellant, System, Velocity, Viscous, Wave, *Wave propagation.

For abstract, see S 04 13.

N66-24952 **Field 20D**
CFSTI Prices HC$6.00 MF$1.25
California Univ., Berkeley.
STUDY OF NONEQUILIBRIUM TWO-PHASE FLOW OF A GAS-PARTICLE MIXTURE TECHNICAL NOTE NO. 2.
by A. K. Oppenheim, and R. L. Panton. Mar 66, 223p NASA-CR-74767, AS-66-5
Grant NSG-702

Descriptors: Dynamics, Energy, Enthalpy, Equation, Fortran, Gas, *Gas dynamics, Liquid, Momentum, *Nonequilibrium flow, Oxygen, Particle, *Particle size, Relaxation, Shock, Size, State, Thermodynamics, Vaporization, Wave, Zone.

For abstract, see S 04 13.

N66-24996 **Field 20D**
CFSTI Prices HC$2.00 MF$0.50
Mississippi State Univ., State College.
RESEARCH STUDY FOR DETERMINATION OF LIQUID SURFACE PROFILE IN A CRYOGENIC TANK DURING GAS INJECTION QUARTERLY PROGRESS REPORT NO. 7, 19 DEC. 1965 - 18 MAR. 1966.
by E. H. Bishop, W. S. Cagle, R. E. Forbes, W. D. Mc cain Jr, and J. T. Smith. 1966, 47p NASA-CR-74724
Contract NAS8-11334

Descriptors: Analysis, Bubble, Cryogenic, *Cryogenic equipment, Equipment, Flow, *Flow rate, Gas, *Gas injection, Injection, Inlet, Liquid, *Liquid surface, Nitrogen, Profile, Rate, Surface, Tank, Water.

For abstract, see S 04 13.

N66-26241 **Field 20D**
CFSTI Prices HC$3.00 MF$0.50
North American Aviation, Inc., Downey, Calif.
A STUDY OF LONGITUDINAL OSCILLATIONS OF PROPELLANT TANKS AND WAVE PROPAGATIONS IN FEED LINES. PART V - LONGITUDINAL OSCILLATION OF A PROPELLANT-FILLED FLEXIBLE OBLATE SPHEROIDAL TANK.
by C. L. Tai, and S. Uchiyama. 31 Mar 66, 58p NASA-CR-74854, SID-66-46-5
Contract NAS8-11490

Descriptors: Axisymmetry, Flexible, Fluid, Frequency, Incompressible, *Incompressible fluid, Inviscid, Longitudinal, *Longitudinal wave, Mode, *Mode shape, Oblateness, Oscillation, *Oscillation frequency, Pressurization, Propellant, *Propellant tank, Shape, Spherical, *Spherical tank, Tank, Wave.

For abstract, see S 04 14.

N66-26243 **Field 20D**
CFSTI Prices HC$2.00 MF$0.50
North American Aviation, Inc., Downey, Calif.
A STUDY OF LONGITUDINAL OSCILLATIONS OF PROPELLANT TANKS AND WAVE PROPAGATIONS IN FEED LINES. PART III - WAVE PROPAGATION IN AN ELASTIC PIPE FILLED WITH INCOMPRESSIBLE VISCOUS STREAMING FLUID.
by S.-A. Fung, and C. L. Tai. 31 Mar 66, 35p NASA-CR-74851, SID-66-46-3
Contract NAS8-11490

Descriptors: Elastic, Feed, Fluid, Incompressible, *Incompressible fluid, Line, Longitudinal, *Longitudinal wave, Pipe, *Pipeflow, Propagation, Stream, Viscous, *Viscous fluid, Wave, *Wave propagation.

For abstract, see S 04 14.

N66-26244 **Field 20D**
CFSTI Prices HC$2.00 MF$0.50
North American Aviation, Inc., Downey, Calif.
A STUDY OF LONGITUDINAL OSCILLATIONS OF PROPELLANT TANKS AND WAVE PROPAGATIONS IN FEED LINES. PART IV - LONGITUDINAL OSCILLATION OF A PROPELLANT-FILLED FLEXIBLE HEMISPHERICAL TANK.
by C. L. Tai, and H. Wing. 31 Mar 66, 35p NASA-CR-74850, SID-66-46-4
Contract NAS8-11490

Descriptors: Axisymmetry, Body, Flexible, *Flexible body, Fluid, Frequency, Hemisphere, *Hemispherical shell, Incompressible, Interface, Inviscid, Oscillation, *Oscillation frequency, Potential, Pressure, Propagation, Propellant, *Propellant tank, Shell, Tank, Velocity, Wave.

For abstract, see S 04 14.

N66-26626 **Field 20D**
CFSTI Prices HC$5.00 MF$1.00
Israel Program For Scientific Translations, Ltd., Jerusalem.
NUMERICAL METHODS IN GAS DYNAMICS.
by L. A. Chudov, and G. S. Roslyakov. 1966, 172p NASA-TT-F-360, TT-65-50138
Transl. Into English Of The Publ. *8chislennye Metody V Gazovoi Dinamike88 Moscow, Izd. Mosk. Univ., 1963 P 1-166 Published For Nasa And Nsf

Descriptors: Boundary, *Boundary layer, *Computation, Dynamics, Flow, Gas, *Gas dynamics, *Gas flow, Layer, Method, Numerical, Seepage, Steady, *U.s.s.r., Viscous, *Viscous flow.

For abstract, see S 04 14.

N66-26659 **Field 20D**
CFSTI Prices HC$3.00 MF$0.50
Michigan Univ., Ann Arbor.
CHOKED FLOW ANALOGY FOR VERY LOW QUALITY TWO-PHASE FLOWS TECHNICAL REPORT NO. 18.
by F. G. Hammitt, and M. J. Robinson. Mar 66, 52p NASA-CR-75127
Grant NSG-39-60
Its Rept.-03424-18-t

Descriptors: Analogy, *Cavitation, Choke, Compressible, Condensation, *De laval nozzle, Flow, *Flow measurement, Gas, Low, Sonic, Velocity, Venturi tube, Wave.

For abstract, see S 04 14.

N66-26885 **Field 20D**
CFSTI Prices HC$4.00 MF$1.00
North American Aviation, Inc., Downey, Calif.
AN ANALYTICAL STUDY OF SEPARATED FLOW ABOUT A CIRCULAR CYLINDER.
by B. H. Ujihara. 25 Jan 66, 149p NASA-CR-75253, SID-65-1730
Contract NAS8-20140

Descriptors: Circular, *Circular cylinder, Cylinder, Flow, *Flow theory, Incompressibility, *Incompressible flow, Layer, Potential, Reynolds number, *Separated flow, Separation, Shear, Symmetry, Theory, Vortex.

For abstract, see S 04 14.

N66-34607 **Field 20D**
CFSTI Prices HC$4.00 MF$1.00
Mississippi State Univ., State College.
STUDY OF PRESSURE LOSSES IN TUBING AND FITTINGS FINAL REPORT, JUN. 1, 1964 - JUN. 1, 1966.
by C. W. Bouchillon, and C. T. Carley Jr. 1966, 130p NASA-CR-77271
Contract NAS8-11297

Descriptors: Computer, *Computer program, Empirical, Equation, Fitting, Flow, *Flow equation, Fluid, Friction, *Friction measurement, Hose, Measurement, Performance, Prediction, Pressure, *Pressure measurement, Program, State, Steady, *Steady state flow, System, Transient, *Tubing.

For abstract, see S 04 20.

N66-34641 **Field 20D**
CFSTI Prices HC$2.00 MF$0.50
Wyle Labs., Inc., Huntsville, Ala.
THE FLUCTUATING PRESSURES DUE TO SHOCK INTERACTIONS WITH TURBULENCE AND SOUND.
by M. V. Lowson. Jun 66, 42p NASA-CR-77313, WR-66-35
Contract NAS8-11308

Descriptors: Field, Fluctuation, Intensity, Interaction, Motion, Near, Pressure, Shock, *Shock wave interaction, Sound, *Sound wave, Surface, *Surface pressure, *Turbulence, Wave.

For abstract, see S 04 20.

N66-34688 **Field 20D**
CFSTI Prices HC$1.00 MF$0.50
Gt. Brit. Ministry Of Aviation, Mottingham.
TURBULENT BOUNDARY LAYER ON A FLAT PLATE IN AN INCOMPRESSIBLE FLUID.
Turbulentnyi Pogranichnyi Sloi Na Ploskoi Plastine V Neszhimaemoi Zhidkosti
by G. S. Glushko. Apr 66, 23p TIL/T-5664
Transl. Into English From Izv. Akad. Nauk Sssr, Ser. Mekh. (Ussr), V. 4, Jul.-aug. 1965 P 13-23

Descriptors: Boundary, Flat, *Flat plate, Fluid, Fluid flow, Incompressible, *Incompressible fluid, Layer, Plate, Reynolds number, Stress, Turbulent, *Turbulent boundary layer, U.s.s.r., Viscosity.

For abstract, see S 04 20.

N66-35135 **Field 20D, 14B**
CFSTI Prices HC$4.00 MF$0.75
National Physical Lab., Teddington (England).
SCHLIEREN METHODS.
by D. W. Holder, and R. J. North. 1963, 114p
Its Notes On Appl. Sci. No. 31

Descriptors: *Aerodynamics, Application, Density, Flow, *Flow visualization, Gas, Principle, Refraction, *Schlieren photography, Shadow, Shock, Study, Technique, Tube, Tunnel, Velocity, Visualization, Vortex, Wind, *Wind tunnel.

For abstract, see S 04 20.

N66-35212 **Field 20D**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
FLOW AND PRESSURE FIELD ANALYSIS OF PARALLEL GROOVE GEOMETRY FOR AN INCOMPRESSIBLE FLUID WITH CONVECTIVE INERTIA EFFECTS.
by R. L. Johnson, L. P. Ludwig, and J. Zuk. Sep 66, 38p NASA-TN-D-3635
Contract 120-27-04-03-22

Descriptors: Analysis, Convection, Effect, Field, Flow, *Flow field, Fluid, Force, Geometry, *Groove, Incompressible, *Incompressible fluid, Inertia, *Inertial force, Parallel, Pressure, *Pressure field.

For abstract, see S 04 20.

N66-35310 **Field 20D**
CFSTI Prices HC$1.00 MF$0.50
Wisconsin Univ., Madison.
A RELATIONSHIP BETWEEN PITZER'S ACENTRIC FACTOR AND THE MORSE INTERMOLECULAR POTENTIAL.
by D. D. Konowalow. 28 Jun 65, 8p NASA-CR-68754, WIS-TCI-107
Grant NSG-275-62
Submitted For Publication

Descriptors: Fluid, *Fluid mechanics, Gas, Hydrocarbon, Mechanics, Molecule, *Morse potential, Nitrogen, Potential, Property, Rare, Structure, Thermodynamic, *Thermodynamic property, Viscosity, Volume.

For abstract, see S 04 20.

PB-172 458 **Field 20D**
CFSTI Prices: HC$10.60 MF$0.75
Hudson Labs., Columbia Univ., Dobbs Ferry, N. Y.
REVIEW OF THREE CLASSIC PROBLEMS IN HYDRODYNAMIC STABILITY.
Technical rept.
by Donald H. Koppel. 15 Feb 60, 104p TR-86
Contract N6-onr-27135
AD-240 897

Descriptors: (*Hydrodynamics, Stability), (*Fluid flow, Stability), (*Couette flow, Stability), Differential equations, Numerical analysis, Reviews.

Identifiers: Poiseuille flow.

A review of three problems in the stability of cer tain fluid flows is given: plane Poiseuille flow, flow completely solved by C. C. Lin; a layer of fluid heated from below, first treated by Rayleigh; and Couette flow, which G. I. Taylor originally solved. The differential equations for the small disturbances from these steady-state flows are derived and the mathematical methods for the solution of these equations treated in detail. Some final numerical results on stability limits in terms of the relevant dimensionless parameters are included. (Author)

PB-172 955 **Field 20**
CFSTI Price: HC$2.60
Brown Univ., Providence, R. I. Div. of Applied Mathematics.
A LIOUVILLE THEOREM IN UNSTEADY GAS DYNAMICS. PART III. A LIMIT LINE THEOREM.
by R. E. Meyer. Jun 60, 26p TR-3
Contract DA-19-020-ORD-5126
Projs. 2311-E, DA-5B99-01-004
AD-240 015

Descriptors: (*Gas flow, Mathematical analysis), Partial differential equations, Stability.

Identifiers: Liouville theorem.

The results of Part II (AD-240 014) are applied to the study of a more general class of solutions admitting vacuum. It is shown that any solution of this class is a part of a 'full' solution, and that every non-trivial, full solution possesses a limit line. (Author)

PB-173 085 **Field 20**
CFSTI Prices: HC$1.00 MF$0.50
Minnesota Univ., Minneapolis.
NEARLY-NORMAL TURBULENCE THEORIES.
by William C. Meecham. 1966, 13p

Descriptors: (*Turbulence, Mathematical analysis), Fluid mechanics, Theory.

The nonlinearity of the governing equations of fluid mechanics leads to the result that statistical turbulence theories generaly are not wholly deductive and require an ad hoc assumption in their formulation. On the basis of experimental evidence one very popular such assumption has been that the fluid fluctuations are in some sense nearly-normaly distributed. Some of the more prominent among recent theoretical attempts of this type are examined here. (Author)

AD-638 781 **See Field 20F**

AD-638 983 **See Field 21E**

AD-638 984 **See Field 21E**

AD-638 985 **See Field 21E**

AD-638 987 **See Field 21E**

AD-639 151 **See Field 1C**

AD-639 185 **See Field 7A**

AD-639 203 **See Field 1C**

AD-639 205 **See Field 1C**

AD-639 264 **See Field 7D**

AD-639 423 **See Field 14B**

AD-639 527 **See Field 20I**

N66-35188 **See Field 12A**

PB-170 866 **See Field 1A**

PB-170 989 **See Field 13B**

PB-172 965 **See Field 13A**

20E. MASERS AND LASERS

AD-638 901 **Field 20E**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
TEMPERATURE DEPENDENCE OF FREQUENCY AND EMISSION WIDTH OF THE R1 LINE OF RUBY.
by M. E. Movsesyan, and Yu. S. Chilingaryan.
25 Apr 66, 8p FTD-TT-65-2006
TT-66-62240
Unedited rough draft trans. of Akademiya Nauk Armyanskoi SSR, Erevan. Doklady, v39 n4 p217-9 1964.

Descriptors: (*Ruby, *Fluorescence), Lasers, Temperature, Line spectrum, USSR.

The conditions for induced radiation are most easily fulfilled for the maximum line of luminescence, and consequently there should be complete coincidence of the dependences on the temperature of the displacement of the maxima of the line of luminescence and the induced emission. In this work there was investigated the shift of the maximum of the line of fluorescence of ruby R1 as depends on the temperature, and this change was compared with the temperature change of the maximum of induced emission.

AD-638 964 **Field 20E**
Not available from CFSTI.
Defence Standards Labs., Maribyrnong (Australia).
TRANSFER EFFICIENCY FORMULA FOR DIFFUSELY REFLECTING LASER PUMPING CAVITIES.
by J. Whittle, and D. R. Skinner. 18 Feb 66, 4p
Availability: Published in Applied Optics v5 n7 p1179-82 Jul 1966.

Descriptors: (*Lasers, *Pumping (Optical)), Australia, Effectiveness, Mathematical prediction, Reflection, Diffusion, Walls, Crystals.

A method is presented for estimating the transfer efficiency of laser pumping cavities that have diffusely reflecting walls. The method is based on the assumption that the light inside the cavity is approximately isotropic. It is demonstrated that such a simplification leads to estimates of transfer efficiency that agree well with estimates obtained by Monte Carlo methods. Curves are given for the proportion of isotropic light absorbed by a cylindrical absorbing crystal as a function of the product of radius and absorption coefficient. This proportion is an important parameter in the transfer efficiency estimation. (Author)

AD-638 967 **Field 20E**
Not available from CFSTI.
TRG, Inc., Melville, N. Y.
INFRARED LASER OSCILLATION IN HBr AND HI GAS DISCHARGES.
by S. M. Jarrett, J. Nunez, and G. Gould. 25 Oct 65, 3p
Contract AF 49(638)-1535
AFOSR-66-1684
Availability: Published in Applied Physics Letters v7 n11 p294-6 Dec 1 1965.

Descriptors: (*Gas discharges, *Lasers), Oscillation, Infrared radiation, Hydrogen compounds, Bromides, Iodides, Halides, Atomic energy levels, Electron transitions.

Identifiers: Hydrogen bromide, Hydrogen iodide.

AD-638 968 **Field 20E**
Not available from CFSTI.
TRG, Inc., Melville, N. Y.
PULSED LASER ACTION IN ATOMIC COPPER VAPOR.
by William T. Walter, Martin Piltch, Nicholas Solimene, and Gordon Gould. 1966, 11p
Contract AF 49(638)-1535
Proj. AF-1478
AFOSR-66-1638
Presented at American Physical Society meeting, New York, Jan 29, 1966.
Availability: Published in Bulletin of the American Physical Society ser2 v11 n1 p113 Jan 1966.

Descriptors: (*Lasers, Vapors), (*Vapors, Copper), Electromagnetic pulses, Measurement.

Identifiers: Defender project.

Following discovery of strogg, pulsed-laser action in the vapor of neutral atomic manganese, other elements were examined for an atomic-level structure that would produce similar, but more efficient, pulsed-laser action. Copper was selected, and oscillations were observed t 5105.5 and 5782.1 A, as predicted. A discharge was produced between tungsten electrodes 80 cm apart in an alumina tube of 1 cm i.d. that was heated to approximately 1500C. Strong, green superradiant pulses were produced without any mirrors. With opaque Ag mirrors 1.58m apart, gain coefficients of 58 and 42 dB/m were measured for the green and yellow lines, respectively, by insertion of known losses. When the beam was extracted through a mirror which transmitted 70% in the green, the peak power of the green laser pulses was 1.2 kW with a 20-nsec width at half-maximum. The efficiency computed from the capacitor energy was 0.1%. When conditions are optimized substantial increases are expected in both efficiency and power output. (Author)

AD-638 978 **Field 20E, 9A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
INTERFERENCE MEASUREMENT OF HOMOGENEITY OF RUBY RESONATOR FOR THE LASER.
by V. Bocek, and V. Kment. 31 Aug 66, 13p
FTD-TT-66-44
TT-66-62249
Unedited rough draft trans. of Jemna Mechanika a Optika (Czechoslovakia), n1 p5-6 1965.

Descriptors: (*Lasers, Ruby), Czechoslovakia, Resonators, Interferometers, Measurement, Defects (Materials).

The report describes experience with interference control of the homogeneity of ruby stick (resonator) for laser. An Askenia IG 140 interferometer was used in the arrangement of the Michelson interferometer with the use of lines 6438 A Cd nd 6328 A He-Ne lasers. (Author)

N66-24992 **Field 20E**
CFSTI Prices KC$3.00 MF$0.75
Massachusetts Inst. Of Tech., Cambridge.
SATURATION BEHAVIOR OF A DOPPLER BROADENED TRANSITION INVOLVING LEVELS WITH CLOSELY SPACED STRUCTURE.
by A. Javan, and K. R. Schlossberg. 1965, 76p NASA-CR-74717
Grant NSG-330

Descriptors: Attenuation, Behavior, Close, *Close packed structure, Coupling *Doppler effect, Gain, Gas, High resolution, Laser, Linear, Nonlinear, Pack, Resonance, *Saturation, Structure, Transition.

For abstract, see S 04 13.

N66-24998 **Field 20E**
CFSTI Prices HC$2.00 MF$0.50
Miami Univ., Coral Gables, Fla.
LASER PROBING OF THE ATMOSPHERE SEMIANNUAL STATUS REPORT.
by S. F. Singer. Mar 66, 30p NASA-CR-74730
Contract NGR-10-007-028

Descriptors: Atmosphere, *Atmospheric composition, *Backscatter, Composition, Density, Design, Experiment, *Laser, Layer, Light, *Light scattering, Molecule, Observation, Particle, Probe, Scattering, System, Upper.

For abstract, see S 04 13.

N66-26252 **Field 20E**
CFSTI Prices HC$1.00 MF$0.50
Smithsonian Astrophysical Observatory, Cambridge, Mass.
PHOTOGRAPHIC MEASUREMENTS OF THE ENERGY DISTRIBUTION IN THE BEAM OF A RUBY LASER.
by P. H. Anderson, C. G. Lehr, and L. A. Maestre. 25 Mar 66, 22p NASA-CR-75102, SAO SPECIAL REPT.-205
Grant NSG-87-60

Descriptors: Angular, Beam, Diffraction, Distribution, Divergence, Energy, *Energy distribution, Laser, Measurement, Photographic, *Photographic measurement, *Photometry, Q-switch, Ruby, *Ruby laser.

For abstract, see S 04 14.

N66-34634 **Field 20E**
CFSTI Prices HC$2.00 MF$0.50
Smithsonian Astrophysical Observatory, Cambridge, Mass.
MEASUREMENTS OF SATELLITE RANGE WITH A R BY LASER.
by P. K. Anderson, C. G. Lehr, and L. A. Maestre. 13 May 66, 38p NASA-CR-77292
Nrant NSG-87-60
Its Spec. Rept.-211

Descriptors: *Be-c, Laser, Measurement, Optical, *Optical radar, Radar, Range, Ruby, *Ruby laser, Satellite, *Satellite tracking, Tracking, Transmitter.

For abstract, see S 04 20.

N66-35171 **Field 20E**
CFSTI Prices HC$5.00 MF$1.25
Perkin-elmer Corp., Norwalk, Conn.
LASER COMMUNICATION SATELLITE EXPERIMENT (LCSE).
by H. F. Wischnia. 1Rul 66, 176p NASA-CR-77462
Contract NAS8-20115
Its Rept.-8399

Descriptors: Apollo spacecraft, Communication, *Communications satellite, Component, Cost, Equipment, Experiment, *Laser, Optical, *Optical equipment, Procedure, Requirement, Satellite, Schedule, Spacecraft, Summary, System, Telescope, Time.

For abstract, see S 04 20.

N66-35245 **Field 20E**
CFSTI Prices HC$6.00 MF$1.50
Perkin-elmer Corp., Norwalk, Conn.
LASER/OPTICS TECHNIQUES SUMMARY REPORT.
by M. S. Lipsett. 29 Apr 66, 257p NASA-CR-77482
Contract NAS8-20115
Its Eng. Rept.-8387

Descriptors: Communication, *Communication system, Deep, *Deep space, Far, Field, Gas, *Gas laser, Instrument, Laser, Optical, *Optics, Space, System, *Telescope.

For abstract, see S 04 20.

AD-638 714 **See Field 14E**

AD-638 973 **See Field 14B**

AD-639 064 **See Field 20L**

20F. OPTICS

AD-638 781 **Field 20F, 20D**
CFSTI Prices: HC$2.00 MF$0.50
Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
FURTHER MEASUREMENTS OF THE NEAR IR SPECTRUM OF SHOCK-HEATED AIR.
Technical rept.
by Walter H. Wurster, nd Paul V. Marrone. Aug 66, 44p CAL-QM-1756-A-1
Contract Nonr-3960 (00), ARPA order-322
Proj. 3740

Descriptors: (*Air, Spectra (Infrared)), (*Shock waves, Propagation), Measurement, Heating, Nitrogen, Infrared radiation, High-temperature research, Shock tubes.

Quantitative spectroscopic measurements were made of the infrared spectrum of shock-heated air and nitrogen between 0.9 nd 1.3 micron. The measurements for air were obtained in the reflected shock region of a shock tube, covering the temperature range 6500-7200K. The nitrogen data were obtained behind incident shock waves for temperatures between 4600-5700K, and in the reflected shock region for temperatures from 6800-7500K. In a previous study it was shown that air radiates much more significantly than nitrogen in this spectral range, and that the radiation could be attributed to transitions between excited electronic states of the nitric oxide molecule. The present measurements confirm these results and also show that the observed excitation energy of the radiation is inconsistent with the energy levels in nitrogen. The data from both studies are reviewed, and it is concluded that the NO hypothesis is consistent with the experimental evidence. (Author)

AD-638 793 **Field 20F**
CFSTI Prices: HC$3.00 MF$0.50
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
OSCILLATOR ANALYSIS OF LiF AND MgO REFLECTIVITY.
Physical sciences research papers.
by Alfred Kahan. May 66, 54p AFCRL-PSRP-229, AFCRL-66-327
Proj. 5621
Task 562104

Descriptors: (*Lithium compounds, Reflection), (*Magnesium compounds, Reflection), Solids, Optical properties, Fluorides, Oxides, Crystal lattices, Vibration, Wave functions, Temperature, Programming (Computers), Semiconductors.

Identifiers: Magnesium oxide, Lithium fluoride.

Classical oscillator theory is applied to the analysis of the fundamental lattice vibration reflectivity spectrum of LiF and MgO in the 200 to 800/cm wave-number range. For each material seven reflectivity curves, ranging from 7.5 to 1060K for LiF and from 8 to 1950K for MgO, are analyzed and the associated dispersion parameters as a function of temperature obtained. The reflectivity curves of both LiF and MgO can be fitted with two resonances at all temperatures. Resonance frequencies nu sub 1 and nu sub 2 are decreasing functions, whereas strengths 4 pi rho sub 1 and 4 pi rho sub 2 are increasing functions of temperature. At the higher temperatures, the width of the main resonance gamma sub 1 obeys a T91.0) power law for LiF and a T (1.5) LAW FOR MgO. In addition, optical constants, real and imaginary parts of the dielectric constant, and absorption coefficients are calculated as functions of wave number and temperature. A description of the classical analysis computer program is included, together with input requirements and FORTRAN IV listings. (Author)

AD-639 280 **Field 20F, 14B**
CFSTI Prices: HC$2.00 MF$0.50
Johns Hopkins Univ., Baltimore, Md.
A RECORDING PHOTOMETER AND ITS USE IN STUDIES OF CATHODE RAY SCREEN DISPLAYS.
by Ferdinand Hamburger Jr. and Ellwood J. King. 1946, 38p
Contract N5ori-166 (01)
SPECDEVCEN-166-1-45

Descriptors: (*Photometers, Recording systems), (*Cathode ray tube screens, Test equipment), Display systems, Design, Calibration, Brightness, Phosphorescent materials.

The design and construction details of a recording electronic photometer are presented. By virtue of its sensitivity, areal selectivity, rapidity of response, and recording capabilities, the instrument is peculiarly suited for measurements of the complex transient light patterns generated by radar indicators. However, applications can also be made to general photometric problems, including those which involve densitometric and contrast measurements. Examples of photometric data obtained with the device from a radar plan position indicator are given and explained. Some additional features of instrumental design, conceived largely through operational experiences, are suggested for an improved version. (Author)

N66-23937 **Field 20F**
CFSTI Prices HC$1.00 MF$0.50
Army Engineer Geodesy, Intelligence And Mapping Research And Development Agency, Fort Belvoir, Va.
TWO APPROACHES TO A PORTABLE COLOR-MEASURING SYSTEM.
by K. D. Robertson. Jan 66, 25p NASA-CR-74694, GIMRADA-RN-15
NASA ORDER R-47-009-02

Descriptors: Cadmium, Color, *Colorimetry, Design, Detector, Light, Measurement, Portability, *Reflectometer, *Spectrophotometer, Sulfide.

For abstract, see S 04 13.

N66-24119 **Field 20F**
CFSTI Prices HC$7.00 MF$2.00
Macneal-schwendler Corp., San Marino, Calif.
RELATIVE ENERGY FLUX DENSITIES IN THE PENUMBRAE OF VARIOUS SHADOWING OBJECTS OF ANALYSIS OF THERMAL TEST ERRORS RESULTING FROM IMPERFECTLY COLLIMATED SOLAR SIMULATION BEAMS, APPENDIX B.
by J. J. Brooks, and E. J. Gooze. 21 Mar 66, 387p NASA-CR-74016
Contracts NAS7-100, JPL-951330
Prepared For Jpl

Descriptors: Beam, Black, Collimation, Configuration, Cylinder, Density, Energy, Flux, *Flux density, Penumbra, Shadow, Simulation, Solar, *Solar simulation, Temperature, Test.

For abstract, see S 04 13.

N66-24416 **Field 20F, 14B**
CFSTI Prices HC$2.00 MF$0.50
Institut Franco-allemand De Recherches, St. Louis (France).
COMPARISON OF JOYCE'S MICROHYDROMETER WITH THE ZEISS REGISTERING PHOTOMETER.
Vergleich Des Mikrodensitometers Von Joyce Mit Dem Registrierphotometer Von Zeiss
by H. Mach. 28 Nov 63, 29p T-25/63
In German

Descriptors: Bar, Density, *Density measurement, Emulsion, Measurement, *Microdensitometer, *Optical density, Optics, Photography, *Photometer, Prism, Registration, Resolution, Shadow, Spectrum.

For abstract, see S 04 13.

N66-24577 **Field 20F**
CFSTI Prices HC$3.00 MF$0.75
National Physical Lab. Of Israel, Jerusalem.
RESEARCH ON OPTICS OF SELECTIVE SURFACES FINAL REPORT, 1 JUN. 1963 - 31 OCT. 1964.
by H. Tabor. 1964, 74p AFCRL-65-625, AD-620506
Contract AF 61/052/-659

Descriptors: Absorber, Absorption, Analysis, Chemistry, Coating, Energy, Film, Filter, Mathematics, Metal, *Metal film, Optical, *Optical property, Optics, Oxide, Physical, Power, Property, Radiation, *Radiation absorption, Reflection, Solar, *Solar absorber, Space, Surface, *Surface property, Thin, *Thin film.

For abstract, see S 04 13.

N66-24594 **Field 20F**
CFSTI Prices HC$3.00 MF$0.75
Ohio State Univ. Research Foundation, Columbus.
AN ANALYSIS OF THE EFFECTS OF NON-ZERO BANDWIDTHS ON THE SECOND ORDER NONLINEAR OPTICAL INTERACTIONS.
by J. T. Mayhan. 9 Nov 64, 67p NASA-CR-74620
Grant NSG-74-60

Descriptors: Application, *Bandwidth, Detector, Interaction, Laser, Model, Nonlinear, Nonzero, Optical, *Optical property, Order, Property, Radiation, Receiver, Second, Submillimeter, *Submillimeter wave, Wave, Wavelength.

For abstract, see S 04 13.

N66-24599 **Field 20F**
CFSTI Prices HC$4.00 MF$1.00
Space-general Corp., El Monte, Calif.
MICROWAVE RADIOMETER DESIGN AND DEVELOPMENT FIRST QUARTERLY REPORT, 1 OCT. 1965 - 1 JAN. 1966.
1966, 123p NASA-CR-71883, SGC-939R-3
Contract NAS5-9680

Descriptors: *Calibration, Control, Design, Fabrication, *Meteorological satellite, Meteorology, Microwave, *Microwave radiometer, Performance, Quality, Radiometer, *Reliability, Satellite, System, Test.

For abstract, see S 04 13.

N66-25370 **Field 20F**
CFSTI Prices HC$2.00 MF$0.50
Georgia Inst. Of Tech., Atlanta.
A SUBMILLIMETER INTERFERENCE SPECTROMETER - CHARACTERISTICS, PERFORMANCE AND MEASUREMENTS.
by K. H. Breeden, W. K. Rivers, and A. P. Sheppard. May 66, 49p NASA-CR-495
Grant NSG-258

Descriptors: Absorption, Characteristics, Constant, Detector, Dielectric, Filter, High resolution, *Interferometer, Measurement, Performance, *Performance characteristics, *Spectrometer, Submillimeter, *Submillimeter wave, Vapor, Water, Wave.

For abstract, see S 04 13.

N66-25577 **Field 20F**
CFSTI Prices HC$2.00 MF$0.50
Ltv Aerospace Corp., Dallas, Tex.
LTV BETA-GAMMA, SPECTROMETER, MODEL BG-1 FINAL REPORT.
by N. E. Chappell, and B. J. Farmer. Aug 65, 41p NASA-CR-65354
Contract NAS9-4013
Its Rpt.-0-71000/5r-23

Descriptors: Beta, *Bremsstrahlung, Cosmic, *Cosmic ray, *Counter, Crystal, Decay, De-

tector, Electron, *Electron spectrum, Gamma, Height, Linear, Memory, Phosphor, Pulse, Ray, Scintillation, Spacecraft, *Spectrometer, Spectrum, Time.

For abstract, see S 04 14.

N66-26255 Field 20F
CFSTI Prices HC$2.00 MF$0.50
Iit Research Inst., Chicago, Ill.
INVESTIGATION OF LIGHT SCATTERING IN HIGHLY REFLECTING PIGMENTED COATINGS QUARTERLY REPORT, FEB. 1 - MAY 1, 1966.
by M. R. Jackson, B. H. Kaye, and G. A. Zerlaut.
3 May 66, 43p NASA-CR-75044, IITRI-U6003-18
Contract NASR-65/07/

Descriptors: Cluster, Coating, Concentration, Function, Light, *Light scattering, *Mie scattering function, Mie theory, *Monte carlo method, Particle, *Pigment, Reflection, Scattering, Shape, Size.

For abstract, see S 04 14.

N66-26660 Field 20F
CFSTI Prices HC$3.00 MF$0.75
Little (Arthur D.), Inc., Cambridge, Mass.
MEASURED DIRECTIONAL REFLECTANCES OF CHARS IN THE UV, VISIBLE, AND NEAR INFRARED.
Mar 66, 79p NASA-CR-75128, C-66658
Contracts NAS7-100, JPL-950867
Prepared For Jpl

Descriptors: Ablation, Absorption, Apparatus, Carbonaceous, *Char, Direction, Graphite, Heat, Infrared, Magnesium, Material, Measurement, Near, *Near infrared, Oxide, Pyrolysis, Radiation, *Spectral reflectance, Spectrum, Ultraviolet, *Ultraviolet spectrum, Visible, *Visible spectrum, Wavelength.

For abstract, see S 04 14.

N66-35028 Field 20F
CFSTI Prices HC$2.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
LECTURES ON ELECTRON MICROSCOPY. V - THE APPLICATION OF NEGATIVE STAINING TO THE STUDY OF BIOLOGICAL STRUCTURE IN THE ELECTRON MICROSCOPE.
by R. W. Horne. 26 Jun 65, 44p ISS-65/27

Descriptors: Bacteria, Biology, Cell, Cytology, Electron, *Electron microscopy, Histology, *Microbiology, Microscopy, Molecular, *Molecular structure, Negative, *Staining, Structure.

For abstract, see S 04 20.

N66-35180 Field 20F
CFSTI Prices HC$1.00 MF$0.50
Yale Univ., New Haven, Conn.
DESIGN OF TANDEMLY OPERATED FAST SCAN HIGH RESOLUTION MASS SPECTROMETER-GAS CHROMATOGRAPHY PROGRESS REPORT, JAN. 1 - JUN. 30, 1966.
1966, 15p NASA-CR-77463
Grant NSG-192

Descriptors: Analysis, Chromatography, Design, Device, Fast, Gas, *Gas chromatography, High resolution, Instrument, *Instrumental analysis, Mass, *Mass spectrometer, Operation, Scanning, *Scanning device, Spectrometer, Tandem.

For abstract, see S 04 20.

N66-35184 Field 20F
CFSTI Prices HC$2.00 MF$0.50
General Motors Corp., Santa Barbara, Calif.
AZIMUTH AXIS OPTICAL ALIGNMENT SYSTEM FINAL REPORT.
by R. F. Brewster, G. C. Kuipers, W. W. Metheny, and J. N. Siebert. 15 Feb 66, 41p NASA-CR-77524
Contract NAS8-11649

Descriptors: *Alignment, Angular, Attitude, Axis, *Azimuth, Beam, Electronic, *Electronic equipment, Equipment, Information, Instrument, Light, *Light transmission, Optical, *Optical instrument, Phase, *Polarized light, Polarizer, Position, Retroreflection, Transmission.

For abstract, see S 04 20.

N66-35205 Field 20F
CFSTI Prices HC$3.75 MF$1.25
LINEAR SOLAR MODULE - REFINEMENT, MEASUREMENT, AND EVALUATION OF OPTICS FINAL REPORT.
by G. F. Comiskey, J. R. Gettel, and R. A. Karlin.
Aug 65, 226p NASA-CR-54479
Contract NAS3-2794

Descriptors: *Arc lamp, Baffle, Equipment, Mercury, Optical, *Optical equipment, Radiation, Reflector, Simulation, Simulator, Solar, *Solar simulator, Source, Space, Xenon.

For abstract, see S 04 20.

N66-35228 Field 20F
CFSTI Prices HC$3.00 MF$0.75
Itt Industrial Labs., Fort Wayne, Ind.
A DAY-NIGHT HIGH RESOLUTION INFRARED RADIOMETER EMPLOYING TWO-STAGE RADIANT COOLING, VOLUME I FIRST QUARTERLY REPORT, 1 JAN. - 1 APR. 1966.
12 May 66, 92p NASA-CR-77542, ITTIL-66-1029
Contract NAS5-10113

Descriptors: Cooler, Cooling, Day, Design, Detector, Earth, Emissivity, Environment, Gold, Infrared, *Infrared detector, Night, *Nimbus satellite, Orbit, Performance, Radiation, *Radiation cooling, *Radiometer, Testing, Thermal.

For abstract, see S 04 20.

N66-35229 Field 20F
CFSTI Prices HC$3.00 MF$0.75
Itt Industrial Labs., Fort Wayne, Ind.
A DAY-NIGHT HIGH RESOLUTION INFARED RADIOMETER EMPLOYING TWO-STAGE RADIANT COOLING, VOLUME II FIRST QUARTERLY REPORT, 1 JAN. - 1 APR. 1966.
1966, 58p NASA-CR-77541
Contract NAS5-10113
For Abstract See N66-35228 20-23

Descriptors: Appendix, Calculation, Cone, Constant, Cooler, Cooling, Detector, Earth, Emission, Emissivity, Gold, Infrared, *Infrared detector, Nimbus satellite, Optimization, Problem, Radiation, *Radiation cooling, Solution, Time, *Time constant, *View factor.

For abstract, see S 04 20.

N66-35235 Field 20F
CFSTI Prices HC$2.00 MF$0.50
General Dynamics/convair, San Diego, Calif.
BIDIRECTIONAL SPECTROREFLECTOMETER MANUAL.
Apr 66, 39p NASA-CR-77172, PIN-65-464
Contract NAS8-20512

Descriptors: Alignment, Apparatus, Assembly, Component, Instrument, Light, *Manual, Measurement, Monochromatic, Operation, Recording, *Reflectometer, *Spectrometer.

For abstract, see S 04 20.

AD-639 002 See Field 20C

AD-639 158 See Field 20K

AD-639 390 See Field 5E

AD-639 485 See Field 3A

PB-170 829 See Field 7D

20G. PARTICLE ACCELERATORS

AD-638 776 Field 20G, 18D
Not available from CFSTI.
Harvard Univ., Cambridge, Mass. Cyclotron Lab.
MONOKINETIC NEUTRON BEAM IN THE RANGE OF 50 TO 150 MEV.
by D. F. Measday. 5 Sep 65, 9p
Contract Nonr-1866 (19)
Proj. NR-024-012
Availability: Published in Nuclear Instruments and Methods v40 p213-20 1966.

Descriptors: (*Neutron beams, Production), Proton bombardment, Deuterium.

A monokinetic neutron beam has been developed. The beam is produced by bombarding a liquid deuterium target with protons. By varying the proton energy the neutron energy is changed; energies from 50 to 150 MeV can be obtained. The neutron beam has an energy width of between 6 and 10 MeV. The main contribution to the width is the energy loss of the protons in the deuterium target. At full energy the neutron intensity is 4 x 10 to the 4th power/sec. The beam greatly simplifies neutron-proton scattering experiments and also enables one to undertake nuclear spectroscopy. (Author)

N66-25501 Field 20G
CFSTI Prices HC$1.00 MF$0.50
Comitato Nazionale Per L Energia Nucleare, Frascati (Italy).
A LIQUID HE3 TARGET FOR HIGH ENERGY NUCLEAR EXPERIMENTS.
by I. Modena, V. Montelatici, and F. Scaramuzzi.
21 Jan 66, 12p LNF-66/1
Its Nota Interna No. 302

Descriptors: Beam, Compound, *Cryostat, Deuterium, Gamma, *Gamma ray beam, Helium, *Helium 3, High energy, Hydrogen, Liquid, *Liquid helium, Nickel, Nuclear, *Nuclear energy, *Photodissociation, Ray, Synchrotron, Target, Vacuum.

For abstract, see S 04 14.

N66-25540 Field 20G
CFSTI Prices HC$4.00 MF$0.75
Geophysics Corp. Of America, Bedford, Mass. Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SPUTTERING ION SOURCE STUDY PROGRAM, PHASE 1 FINAL REPORT, 31 JUL. 1961 - 28 JAN. 1962.
28 Jan 62, 105p NASA-CR-74943
Contracts NAS7-100, JPL-950118
Prepared For Jpl

Descriptors: Bombardment, Design, Duoplasmatron, Gas, Housing, Inert, Ion, *Ion source, Ionization, Pumping, Solid, *Solids, Source, *Sputtering.

For abstract, see S 04 14.

N66-25541 Field 20G
CFSTI Prices HC$2.00 MF$0.50
Geophysics Corp. Of America, Bedford, Mass. Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SPUTTERING ION SOURCE, THIRD PHASE FINAL REPORT, 29 MAR. - 30 SEP. 1963.
by H. J. Liebl. 1963, 33p NASA-CR-74944,

GCA-TR-63-7-G
Contracts NAS7-100, JPL-950576
Prepared For Jpl

Descriptors: Alloy, Argon, Bombardment, *Duoplasmatron, Gas, Ion, *Ion source, Ionization, Noble, Optics, Power, *Power supply, *Solids, Source, Spectrum, *Sputtering, Supply, Zirconium.

For abstract, see S 04 14.

N66-26876 **Field 20G**
CFSTI Prices HC$2.00 MF$0.50
Space Sciences, Inc., Waltham, Mass.
DEVELOPMENT OF A CONTINUOUSLY OPERATING SOURCE OF VACUUM ULTRAVIOLET AND SOFT X-RADIATION FINAL REPORT.
1965, 42p NASA-CR-75282
Contract NAS5-3910

Descriptors: Arc, Design, Field, Helium, *Instrument, Magnetic, Mirror, Radiation, *Radiation source, Source, Spectrum, Ultraviolet, *Ultraviolet radiation, Vacuum, Wavelength, *X-ray.

For abstract, see S 04 14.

AD-639 164 **See Field 20C**

20H. PARTICLE PHYSICS

AD-638 824 **Field 20H**
Not available from CFSTI.
Lyman Lab. of Physics, Harvard Univ., Cambridge, Mass.
T-INVARIANCE AND THE NEUTRON ELECTRIC DIPOLE MOMENT.
by D. G. Boulware. 21 May 65, 6p
Contract AF 49 (638)-1380
Proj. AF-9751
Task 975101
AFSOR-66-0794
Availability: Published in Il Nuovo Cimento v40 (Ser10) p1041-4 Dec 21 1965.

Descriptors: (*Selection rules, *Invariance), (*Neutrons, Dipole moments), Nuclear models.

The results of calculations of the neutron electric dipole moments predicted by various models of CP violation are given. It is concluded that Ramsey's proposed measurement of the electric dipole moment should provide a test for the existence of strangeness conserving CP violating interactions. (Author)

AD-638 826 **Field 20H, 7D**
Not available from CFSTI.
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
ELECTRON CAPTURE FROM ATOMIC NITROGEN BY PROTONS.
Physical sciences research papers.
by Robert A. Mapleton. 17 Dec 65, 6p AFCRL-66-545, AFCRL-PSRP-255
Proj. AF-8627
Task 862706
Availability: Published in The Physical Review v145 n1 p25-6 May 6 1966.

Descriptors: (*Electron capture, *Protons), (*Nitrogen, Atomic orbitals), Proton cross sections.

The total Oppenheimer-Brinkman-Kramers (OBK) cross sections for 1s-, 2s-, and 2p-orbital electron capture from atomic nitrogen by protons are adjusted to correspond to capture from N2 by deuterons, and are compared with recent measurements of Berkner et al. Calculated cross sections for 1s capture are dominant above 3 MeV, and the total OBK cross section still exceeds the measured cross section at the deuteron energy of 21.5 MeV. (Author)

AD-638 837 **Field 20H**
Not available from CFSTI.
Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
ANGULAR-CORRELATION MEASUREMENTS AND THE Si30 (p, gamma)P31 REACTION.
Revised ed.
by Gale I. Harris, and D. V. Breitenbecher. 13 Jan 66, 25p ARL-66-0127
Proj. AF-7114
Revision of manuscript submitted 2 Dec 65.
Availability: Published in The Physical Review v145 n3 p866-87 May 20 1966.

Descriptors: (*Silicon, *Proton bombardment), (*Phosphorus, *Nuclear energy levels), (*Gamma emission, Silicon), Decay schemes, Excitation, Nuclear resonance, Nuclear models.

Results are given of directional-correlation and spectroscopic measurements on gamma-ray transitions from resonances in the Si30 (p,gamma)P31 reaction formed with bombarding energies between 1.0 and 1.5 MeV. Specific emphasis is placed on the determination of properties of the bound states at Ex=3.29, 3.51, 4.26, and 4.63 MeV excited via cascades from the resonances at Ep=1095, 1204, and 1322 keV. The measurements yield new information on the spins, decay schemes, and multipolarity mixings of transitions of the indicated bound states. An angular-correlation analysis technique is introduced which takes advantage of the factored form of the triple-correlation functions and the more efficient computer search programs which result. A discussion and comparison of existing data on P31 levels with results of recent model calculations is given. (Author)

AD-638 907 **Field 20H, 4A**
CFSTI Prices: HC$2.00 MF$0.50
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
EXPLORER 12 OBSERVATIONS OF CHARGED PARTICLES IN THE INNER RADIATION ZONE.
by K. L. Ackerson, and L. A. Frank. Jun 66, 41p
Rept. no. 66-13
Contract Nonr-1509 (06), Grant NsG-233-63

Descriptors: (*Charged particles, *Van Allen Radiation belt), Scientific satellites, Space environmental conditions.

Identifiers: Explorer.

AD-638 955 **Field 20H, 18D**
Not available from CFSTI.
Vienna Univ. (Austria). Physikalisches Institut (I).
UNTERSUCHUNG DES MOBBAUERSPEKTRUMS DER K-KONVERSIONSLINIE VON FE57 MIT HILFE EINES HYDRAULISCHEN MOBBAUERSPEKTROMETERS (Investigation of the Mossbauer Spectrum of the K X-Ray of Fe57 by Means of A Hydraulic Mossbauer Analyzer).
oy P. Schabel, and E. Ujlaki. 1965, 12p
Contract AF 61 (052)-845
Proj. AF-9767
Task 976701
AFOSR-66-1683
Text in German.
Availability: Published in Acta Physica Austriaca v21 n1-2 p154-62 1965.

Descriptors: (*Iron, Mossbauer effect), (*Mossbauer effect, Instrumentation), X rays, Emissivity, Doppler effect, Electron capture, Stainless steel, Foils, Austria.

A Mossbauer analyzer was developed by using the constant flow of a viscous liquid. The principal parts of its construction are described; the results of some Mossbauer resonance experiments performed are given, including especially the investigation of the velocity spectrum of the K conversion X ray occuring at resonance scattering by a stainless steel foil containing natural Fe57 abundance. (Author)

AD-638 976 **Field 20H, 20K, 11F**
CFSTI Prices: HC$3.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
JOURNAL OF PHYSICS: 1964, VOL. 20, NO. 1: SELECTED ARTICLES.
by F. N. Skripof, Wang I-tseu, Ma Ying-liang, and Ting-sui Ke. 31 May 66, 53p FTD-TT-65-1051 TT-66-62247
Unedited rough draft trans. of Wu Li Hsueh Pao (Chinese People's Republic), v20 n1 p41-54, 72-82 1964.

Descriptors: (*Fluorides, Nuclear magnetic resonance), (*Martensite, Internal friction), Ions, Crystals, Solutions, China, Carbon alloys, Steel, Line spectrum.

Contents: A study of chemical shift in the nuclear magnetic resonance of fluoride ions in crystals and in solutions, Internal friction peaks associated with the coherency of the decomposition products of high-carbon and low-carbon martensites.

AD-639 048 **Field 20H, 9B**
CFSTI Prices: HC$1.00 MF$0.50
Army Nuclear Defense Lab., Edgewood Arsenal, Md.
NEP-12, A COMPUTER PROGRAM FOR NUCLEAR EMULSIONS.
by Richard V. Mancuso, and Austin W. Barrows. Sep 66, 24p NDL-TM-34
Task NWER-11.025

Descriptors: (*Particle trajectories, *Programming (Computers)), (*Photographic emulsions, Particle trajectories), Neutrons, Protons, Energy, Scattering.

A code is described which calculates neutron energy from knock-on proton track length and orientation in nuclear research emulsions. The code contains a sorting routine which sorts the neutron energies into preselected energy intervals, and a plotting routine which plots the neutron energy spectrum. The code may be used for any emulsion by calling the appropriate subroutine which contains the range-energy relation for the emulsion used. The program is applicable to any experiment where a neutron energy spectrum is desired. (Author)

AD-639 078 **Field 20H**
Not available from CFSTI.
Pittsburgh Univ., Pa. Sarah Mellon Scaife Radiation Lab.
DOPPLER WIDTH OF THE ANNIHILATION LINE FROM POSITRONS STOPPED IN OXYGEN.
by J. E. Brimhall, and L. A. Page. 29 Nov 65, 11p
AROD-3347:4
Availability: Published in Il Nuovo Cimento v43 (ser10) p119-29 May 11, 1966.

Descriptors: (*Oxygen, Annihilation reactions), (*Positrons, Annihilation reactions), (*Annihilation reactions, *Doppler effect), Line spectrum, Radiation measurement systems, Semiconductor devices, Photons.

The Doppler-broadened portion of the 511 keV annihilation line in oxygen was measured with a germanium detector to have an r.m.s. width (1.27 plus or minus .0.11) keV which is consistent with the angular width deduced from two-quantum angular correlation work. (Author)

AD-639 228 **Field 20H**
CFSTI Prices: HC$3.00 MF$0.75
Pittsburgh Univ., Pa.
PARTICLE PHYSICS AND NUCLEAR DECAY.
Final rept., 17 Nov 61-30 Sep 65.
by Lorne A. Page, and James E. Brimhall. 30 Sep 65, 66p
Grants DA-ARO (D)-31-124-G217, DA-ARO

(D)-31-124-G689
Projs. DA-20014501B11B, AROD-3347P
AROD-3347:7

Descriptors: (*Positronium, *Annihilation reactions), Doppler effect, Annihilation radiation, Positrons, Photomultipliers, Gamma rays, Charged particles, Polarization, Magneto-optic effect.

An investigation of positronium and annihilation is summarized. (Author)

AD-639 252 **Field 20H**
Not available from CFSTI.
Yale Univ., New Haven.
ELECTROSTATIC EFFECTS IN NUCLEON-NUCLEON SCATTERING AT INTERMEDIATE ENERGIES.
by R. E. Seamon, K. A. Friedman, and G. Breit.
20 Dec 65, 8p
Grant DA-ARO (D)-31-124-G799
Proj. 893-P
AROD-893:108
Availability: Published in Physical Review v145 n3 p779-86 May 20 1966.

Descriptors: (*Proton scattering, Electrostatics), (*Neutron scattering, Electrostatics), (*Nuclear scattering, Electrostatics), Potential theory, Mathematical models, Nucleons, Pions, Nuclear forces, Nuclear cross sections.

Making use of a local static potential model of the nucleon-nucleon interaction, estimates of the effect of the electrostatic interaction on tests of long-range charge independence are made, with special reference to data analyses in which the I = 1 phase shifts are assumed to be the same in p-p and n-p scattering at bombarding energies above 10 MeV.

AD-639 257 **Field 20H**
Not available from CFSTI.
National Magnet Lab., Mass. Inst. of Tech., Cambridge.
ANTIFERROMAGNETIC RESONANCE IN DOPED ALPHA IRON OXIDE.
by S. Foner, E. J. McNiff Jr, and J. P. Remeika.
1966, 3p
Contract AF 49 (638)-1468
Proj. AF-9764
AFOSR-66-1795
Prepared in cooperation with Bell Telephone Labs., Inc. Murray Hill, N. J.
Availability: Published in Journal of Applied Physics v37 n3 p1140 Mar 1 1966.

Descriptors: (*Magnetic resonance, Iron compounds), (*Iron compounds, Oxides), Antiferromagnetism, Doping, Single crystals.

Antiferromagnetic resonance (AFMR) in small single crystals of a-Fe203 doped with various impurities has been examined at 120 Gc/sec from 4.2K to 300K with pulsed fields. (Author)

AD-639 315 **Field 20H**
Not available from CFSTI.
Cavendish Lab., Univ. of Cambridge (England).
NUCLEAR REACTIONS IN NUCLEAR MATTER.
by D. J. Thouless, 19 Mar 65, 20p
Grant AF-EOAR-79-63
Proj. AF-9751
Task 975101
AFOSR-66-1329
Availability: Published in Nuclear Physics v75 p128-44 1966.

Descriptors: (*Nuclear reactions, *Nuclear models), Elastic scattering, Green's function, Deuterons, Inelastic scattering, Optics, Great Britain.

A number of topics in nuclear reaction theory are examined from the point of view of the liquid drop model. It is shown that, although the absolute value of the nucleon strength function at low energies has significance for high-energy experiments, it cannot be deduced from low-energy elastic scattering experiments, since the energy-dependence and the non-locality of the optical potential cannot be distinguished. The depth of the optical potential for a deuteron in the interior of a nucleus should be at least as great as the sum of the neutron and proton optical potential depths (minus the binding energy of a deuteron), or else the deuteron will dissociate in the interior. A simple inelastic interaction is considered and it is shown that, although the absolute value of the nucleon strength function again cannot be determined, the coefficients of the Bogolyubov-Valatin quasiparticle transformation can, under reasonable conditions, be deduced from such an experiment. The absorption of a nucleon in the nuclear surface is considered and it is shown that, in the absence of pairing, the surface absorption, like the volume absorption, goes to zero as (E-E sub v) when the energy E approaches the Fermi energy E sub f. (Author)

AD-639 436 **Field 20H, 8N**
CFSTI Prices: HC$3.00 MF$0.75
Air Force Weapons Lab., Kirtland AFB, N. Mex.
A COMPUTATIONAL MODEL FOR GEOMAGNETICALLY TRAPPED PARTICLE SHELLS AND KINEMATIC PARAMETERS.
Technical rept., Oct 65-Jun 66.
by Juan G. Roederer, and James V. Herod. Sep 66, 78p AFWL-TR-66-78
Proj. AF-5710
Prepared in cooperation with Goddard Space Flight Center, Greenbelt, Md.
Research supported in part by DASA.

Descriptors: (*Programming (Computers), *Particle trajectories), (*Terrestrial magnetism, *Charged particles), Mechanics.

A computer program has been constructed which calculates a model for geomagnetically trapped particle shells and the associated kinematic parameters. Included is the calculation of longitude-dependent drift velocities and bounce paths. This document explains the methods used in constructing the program as well as the input and output of the code. (Author)

AD-639 521 **Field 20H**
Not available from CFSTI.
Leicester Univ. (England).
ON INVARIANT AMPLITUDES FOR SCATTERING PROCESSES.
by G. Rasche, and W. S. Woolcock. 14 Dec 64, 11p
Grant AF-EOAR-62-64
Proj. 9751
Task 975101
AFOSR-66-1314
Prepared in cooperation with University Coll., London (England), and Zurich Univ. (Switzerland).
Availability: Published in Nuclear Physics v68 p582-90 1965.

Descriptors: (*Nuclear scattering, S-matrix), (*Pions, Nuclear scattering), (*Nucleons, Nuclear scattering), (*Antiparticles, Nuclear scattering), Vector analysis, Tensor analysis, Wave functions, Nuclear spins, Elastic scattering, Great Britain, Switzerland.

It is shown that, to obtain the partial wave expansion of the invariant reaction amplitudes for pi + N to pi + N and pi + pi to N + anti-N, it is not necessary to use the low energy representation of the Dirac matrices. (Author)

AD-639 533 **Field 20H**
Not available from CFSTI.
University Coll., London (England). Dept. of Physics.
PHOTOPION PRODUCTION, DISPERSION RELATIONS, AND GAMMA-RHO-PI COUPLING.
by Alexander Donnachie, and Graham Shaw. 17 Sep 65, 34p
Grant AF-EOAR-64-62
Proj. AF-9751
Task 975101
AFOSR-66-1622
Availability: Published in Annals of Physics v37 n2 p333-64 Apr 1966.

Descriptors: (*Pions, *Photonuclear reactions), (*Meson reactions, Selection rules), Field theory, Nuclear scattering, Nucleons, Phase shift, Moments, Gamma rays, Great Britain.

Identifiers: Dispersion relations, Rho mesons, Coupling constants.

Fixed t dispersion relations are used to evaluate the transition amplitudes which lead to final S-, P-, and D-wave scattering states. Knowledge of the pion-nucleon scattering phase shifts up to 700 MeV allows the coupled integral equations for the dominant M (1+), E (0+) transitions to be solved explicitly by an iterative method. The other multipoles are assumed to be given in the approximation which is value due to the small values of the scattering phase shifts concerned except in the case of the M (1-)(0,1) and E (1+)(3) transitions. These latter are not amenable to calculation and constitute the principal sources of error. Agreement with experiment is excellent in the case of pi-zero production, but there are systematic discrepances in the case of pi-plus production due to the approximate nature of the M (1+) and E (0+) multipoles. The effect of higher transitions is investigated and found to be small except at extreme forward angles. Initially it was assumed that the gamma-rho-pi coupling constant was zero. After calculation, comparison with low energy experiments yields the value (lambda/e)= 0.05 plus or minus 0.15, consistent with the original assumption. (Author)

AD-639 536 **Field 20H**
Not available from CFSTI.
Stockholm Univ. (Sweden). Inst. of Physics.
SEARCH FOR Y*-NEUTRAL PRODUCTION IN K-NEGATIVE CAPTURES IN NUCLEI.
by P. J. Carlson, O. Danielsson, A. G. Ekspong, and A. Frisk. 7 Apr 65, 18p
Grant AF-EOAR-57-64
Proj. AF-9751
Task 975101
AFOSR-66-1285
Availability: Published in Nuclear Physics v74 n3 p642-56 1965.

Descriptors: (*K mesons, Nuclear reactions), (*Hyperons, Nuclear reactions), (*Meson capture, Hyperons), Sigma hyperons, Pions, Recoil atoms, Radioactive decay, Nuclear isobars, Momentum, Sweden.

Identifiers: Y particles.

An investigation of 128 K-negative interactions at rest in emulsions with a final state of a sigma hyperon, a pion and a recoiling nucleus is reported. The main emphasis is laid on the study of the momentum and invariant mass distributions of the sigma-pi system in order to detect possible isobar Y* production. The distributions show, however, no features which can unambiguously be interpreted as due to resonance production. These results are at variance with results in an earlier experiment at this laboratory where a highly significant peak in the sigma-pi-momentum was reported. The results as well as the collected world data are compared with Adair's theoretical model without appeal to Y* production. Good agreement is obtained with both samples. (Author)

AD-639 541 **Field 20H, 4A**
Not available from CFSTI.
Lund Univ. (Sweden). Dept. of Physics.
A STUDY OF RELATIVISTIC NUCLEUS-NUCLEUS COLLISIONS IN NUCLEAR EMULSIONS.
by B. Andersson, I. Otterlund, and K. Kristiansson. Oct 65, 25p
Grant AF-EOAR-35-64

Proj. AF-9751
Task 975104
AFOSR-66-1305
Availability: Published in Arkiv Fysik Band v31 n37 p527-48 1966.

Descriptors: (*Cosmic rays, Nuclear reactions), (*Nuclei, Cosmic rays), Secondary emission, Kinetic energy, Nucleons, Particle trajectories, Photographic emulsions, Protons, Pions, Cosmic ray bursts, Sweden.

Identifiers: Nuclear emulsions.

Eighty-eight nucleus-nucleus collisions produced in nuclear emulsions by heavy cosmic ray primaries were analysed. The charge of primaries falls in the interval from at least 3 to not more than 26 and the kinetic energy is larger than 1.7 GeV/nucleon. The angular distribution of the shower particles is composed of a narrow distribution probably of protons as the main constituent and a wider distribution which mainly consists of pions. The production of shower particles was found to be in good accordance with what can be expected from the shower particle production in nucleon-nucleon interactions if the nucleon cascades in the target nuclei are considered. The angular distributions of the grey tracks are studied and found to be similar to the corresponding distributions in nucleon-nucleus collisions. The angular and the momentum distributions of the black prongs are consistent with a recoil momentum of the target nuclei of about 20 MeV/c per nucleon. All results are in agreement with the assumption that in the first approximation a nucleus-nucleus collision can be looked upon as a superposition of independent nucleon-nucleus collisions. (Author)

AD-639 542 **Field 20H, 20J**
Not available from CFSTI.
Torino Univ. (Italy). Istituto di Fisica.
INELASTIC ELECTRON-DEUTERON SCATTERING AND THE RESCATTERING CORRECTIONS.
by B. Bosco, B. Grossetete, and P. Quarati. 29 Apr 65, 15p
Grant AF-EOAR-39-64
Proj. AF-9751
Task 975101
AFOSR-66-1713
Prepared in cooperation with Ecole Normale Superieure, Laboratorie de l'Accelerateur Lineair, Orsay, (France).
Availability: Published in The Physical Review v141 n4 p1441-53 Jan 1966.

Descriptors: (*Electrons, *Inelastic scattering), (*Deuteron reactions, Inelastic scattering), Nuclear cross sections, Wave functions, Nucleons, Theory, Italy, France.

Identifiers: Form factors.

The inelastic electron-deuteron scattering is completely re-examined on the basis of recent Orsay experiments. The expression for the differential cross section is derived on a more general basis, the rescattering corrections predicted by different methods are compared extensively, and their effects on the nucleon form factors are discussed. (Author)

AD-639 548 **Field 20H**
Not available from CFSTI.
Torino Univ. (Italy). Istituto di Fisica.
ELECTROPRODUCTION AT THE LIMIT OF VERY HIGH ENERGIES.
by M. Lacombe, and E. Predazzi. 11 Jun 64, 7p
Grant AF-EOAR-39-64
Proj. AF-9751
Task 975101
AFOSR-66-1720
Availability: Published in Il Nuovo Cimento v33 Ser 10 p1466-71 Sep 1964.

Descriptors: (*Electrons, Inelastic scattering), (*Inelastic scattering, *Nuclear cross sections), Nucleons, Electron bombardment, Photonuclear reactions, Nuclear shell models, Vector analysis, Energy, Momentum, Italy.

AD-639 572 **Field 20H, 12A, 18K**
CFSTI Prices: HC$3.00 MF$0.75
Oak Ridge National Lab., Tenn.
RESULTS OF THE ANALYSIS BY MONTE CARLO OF FAST-NEUTRON SHIELDING PROPERTIES OF COMPOUND CUBICAL AND SPHERICAL SHIELDS.
by F. H. Clark, and N. A. Betz. Sep 66, 19p
ORNL-4009
Contract W-7405-eng-26

Descriptors: (*Monte Carlo method, *Shielding), (*Fast neutrons, Shielding), Neutron transport theory, Air.

Identifiers: BREN project.

An extensive program of calculations was performed to check certain fast-neutron dose-rate measurements made at Project BREN in 1962. The response characteristic of the modified long counter was computed. Nitrogen and oxygen cross sections were reviewed and used in calculations of the transport in air of neutrons from a Godiva source to a distance of 66 g/sq cm. Transport results obtained by Monte Carlo were compared with those obtained by the moments method. A spectrum at an 80-g/sq cm penetration was determined. The perturbating effect of a structure on the neutron field in its neighborhood was estimated. The effect of variations of the spectrum with penetration distances on doses computed with different weight functions was also examined; the Snyder-Neufeld multicollision physical dose was found to vary with distance in a way markedly different from others examined. Work was also done on importance sampling techniques, especially the exponential transform, and the sampling problem was formulated in a simplified, approximate expression to facilitate statistical interpretations. Finally, a number of shield penetration calculations were performed to compare with the measurements and to determine the effects of shield shape, shield cavity size, and source angular distributions incident on the shields. The agreement between the calculations and the measurements was within the uncertainty in the detector response characteristic. (Author)

AD-639 614 **Field 20H**
CFSTI Prices: HC$3.00 MF$0.75
Michigan Univ., Ann Arbor. Dept. of Physics.
PROTON-DEUTERON ELASTIC SCATTERING AT HIGH MOMENTUM TRANSFERS.
by Ernest Coleman. Jul 66, 95p Technical rept.
TR-25, Rept. no. 03106-25-T
Contract Nonr-1224 (23)
Proj. NR-022-274

Descriptors: (*Proton scattering, Nuclear cross sections), (*Deuteron reactions, Elastic scattering), (*Elastic scattering, Nuclear cross sections), Momentum, Backscattering, Kinetic energy, Nucleons, Diffraction, Particle beams, Matrix algebra, Wave functions.

An experimental and theoretical investigation of proton-deuteron elastic scattering at high momentum transfers is presented. The differential cross sections for backward elastic scattering at incident proton kinetic energies of 1.0, 1.3, and 1.5 GeV were measured for four-momentum transfer squared (-t) from 2.6 to 5.0 (GeV/c)sq, which corresponds to cosine of center-of-mass proton scattering angles from -0.5 to -0.9. A backward peak is observed, and the slope and magnitude of the peak were determined. At 2.0 GeV for forward elastic differential cross section was measured for -t from 0.44 to 1.54 (GeV/c)sq. A shoulderlike departure from the forward diffraction peak was observed. The one-nucleon exchange peripheral model was successful in interpreting the backward peak. Calculations based on modern three-body quantum mechanical formalisms for the three-nucleon system supporting a two-body bound state also suggest the one-nucleon exchange process as the dominant mechanism. The measured forward differential cross section has been explained by the importance of double-scattering of the incident proton at higher momentum transfers. A negative value for the ratio of the real part to the imaginary part of the neutron-proton elastic scattering amplitude at 2.0 GeV is shown to yield maximum agreement with the experimental data. (Author)

N66-23959 **Field 20H**
CFSTI Prices HC$1.00 MF$0.50
Ecole Normale Superieure, Paris (France).
BAND STRUCTURE AND DISPERSION RELATIONS IN II-IV COMPOUNDS ANNUAL SUMMARY REPORT NO. 2, 1 OCT. 1964 - 31 DEC. 1965.
by M. Balkanski. 31 Dec 65, 9p ARL-66-0036, AD-629201
Contract AF 61/052/-757

Descriptors: Alloy, Cadmium, Chemical, *Chemical compound, Compound, Dynamics, Electron, *Electron transition, Energy, *Energy level, Faraday rotation, Interaction, Lattice, Level, Magneto-optic, Phonon, Photon, Physics, Plasma, Selenium, Sulfide, Transition.

For abstract, see S 04 13.

N66-24107 **Field 20H**
CFSTI Prices HC$2.00 MF$0.50
Geophysics Corp. Of America, Bedford, Mass. Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SPUTTERING ION SOURCE STUDY PROGRAM FINAL REPORT, 29 JAN. - 15 NOV. 1962.
15 Dec 62, 31p NASA-CR-71924, GCA-TR-62-10-G
Contract JPL-950118

Descriptors: Atom, Beam, Fast, Figure, Gas, *Gas-ion interaction, Interaction, Ion, *Ion source, Mass, *Mass spectrometer, Noble, Solid, Source, Spectrometer, *Sputtering.

For abstract, see S 04 13.

N66-24310 **Field 20H**
CFSTI Prices HC$1.00 MF$0.50
Comitato Nazionale Per L Energia Nucleare, Frascati (Italy).
DETERMINATION OF THE BRANCHING RATIOS AMONG THE NEUTRAL DECAY MODES OF THE ETA-PARTICLE.
by M. Giorgi, G. Di Giugno, R. Querzoli, P. Schiavon, and V. Silvestrini. 1 Mar 66, 11p LNF-66/9

Descriptors: Apparatus, Branch, Decay, Determination, Elementary, *Elementary particle, Eta, *Eta-meson, Experiment, Meson, Method, Mode, Neutral, *Neutral particle, Particle, *Particle decay, Photon, Pion, Ratio.

For abstract, see S 04 13.

N66-24324 **Field 20H**
CFSTI Prices HC$4.00 MF$0.75
Istituto Superiore Di Sanita, Rome (Italy).
KINEMATICS OF THE (E,E,P) REACTION.
Cinematica Della Reazione (E,e8p)
by D. Guicci. 23 Dec 65, 110p ISS-65/49
In Italian, English Summary

Descriptors: Calculation, Collision, Computer, Electron, *Electron collision, Elementary, *Elementary particle, Fortran, *Kinematics, *Nucleon, Particle, *Particle collision, Program, Proton, *Table.

For abstract, see S 04 13.

N66-24342 **Field 20H**
CFSTI Prices HC$1.00 MF$0.50
Aktiebolaget Atomenergi, Stockholm (Sweden).

TOTAL CROSS SECTIONS OF U, UO2 and TH 02 FOR THERMAL AND SUBTHERMAL NEUTRONS.
by S. F. Beshai. Mar 66, 17p AE-222

Descriptors: Alpha, Bragg equation, Calculation, Cross section, Dioxide, Edge, Energy, Equation, Flight, Oxide, Position, *Thermal neutron, Thorium, *Thorium oxide, Time, *Uranium oxide.

For abstract, see S 04 13.

N66-24403 Field 20H
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CORRELATIONS OF MAGNETIC FIELDS AND ENERGETIC ELECTRONS OF THE IMP-I SATELLITE.
by K. A. Anderson, and N. F. Ness. Mar 66, 67p NASA-TM-X-55467, X-612-66-109

Descriptors: Charge, Correlation, Dark, Earth, Electron, Energetic, *Explorer xviii satellite, Field, High energy, *High energy electron, Magnetic, *Magnetic field, Observation, Particle, Satellite, Side.

For abstract, see S 04 13.

N66-24418 Field 20H
CFSTI Prices HC$3.00 MF$0.75
Palermo Univ. (Italy).
RESEARCH ON NUCLEAR PHYSICS.
Ricerche Sulla Fisica Dei Nuclei
1966, 98p EUR-2465.I
In Italian, English Summary

Descriptors: Interaction, Ionization, *Ionizing radiation, Low energy, Matter, Nuclear, *Nuclear physics, *Photon, Physics, Radiation, Research, Review.

For abstract, see S 04 13.

N66-24443 Field 20H
CFSTI Prices HC$3.00 MF$0.75
Laboratoire De Physique Theorique Et Des Hautes Energies, Orsay (France).
REMARKS ON RELATIVISTIC STATISTICAL MECHANICS. II - DYNAMICS.
by R. Hakim. Mar 66, 70p TH/137

Descriptors: *Dynamics, Equation, Field, Gravity, Interaction, Kinetic, Mechanics, Particle, Phase, *Relativity, Space, Statistical, *Statistical mechanics, System.

For abstract, see S 04 13.

N66-24642 Field 20H
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ROCKET MEASUREMENTS OF ENERGETIC ELECTRON PRECIPITATION IN THE AURORAL ZONE.
by D. S. Evans. Jan 66, 33p NASA-TM-X-55447, X-611-66-9

Descriptors: Aurora, *Auroral zone, Channel, Counter, Detector, Electron, *Electron precipitation, Energy, Flux, Measurement, Multiplier, Precipitation, Rocket, *Rocket measurement, Scintillation, Sounding, Spectrometer, Spectrum, Zone.

For abstract, see S 04 13.

N66-24683 Field 20H
CFSTI Prices HC$1.00 MF$0.50
California Univ., La Jolla.
THE SPECTRUM OF CRAB NEBULA X-RAYS TO 120 KE V.
by A. S. Jacobson, R. M. Pelling, and L. E. Peterson. 21 Dec 65, 12p UCSD-SP-65-5
Grant NSG-318

Descriptors: Balloon, *Balloon flight, Computer, Counting, *Counting rate computer, *Crab nebula, Data, Detection, Distribution, Flight, Height, Pulse, *Pulse height, Rate, Spectral, Telemetry, X-ray.

For abstract, see S 04 13.

N66-24691 Field 20H
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON THE PRODUCTION OF LOW-ENERGY COSMIC-RAY ELECTRONS.
by P. B. Abraham, K. A. Brunstein, and T. L. Cline. Feb 66, 75p NASA-TM-X-55458, X-611-66-57

Descriptors: Corpuscular, *Corpuscular radiation, Cosmic, *Cosmic ray, *Electron, Emission, Galaxy, Hypothesis, Intensity, Interplanetary, Origin, Primary, Radiation, *Radiation source, Ray, Secondary, Solar, Source, Spectrum, Velocity.

For abstract, see S 04 13.

N66-24882 Field 20H
CFSTI Prices HC$2.00 MF$0.50
Aktiebolaget Atomenergi, Stockholm (Sweden).
NEUTRON SCATTERING IN HYDROGENOUS MODERATORS, STUDIED BY TIME DEPENDENT REACTION RATE METHOD.
by L. G. Larsson, E. Moller, and S. N. Purohit. Mar 66, 31p AE-223

Descriptors: *Absorber, Absorption, Cadmium, Calculation, Dependency, Detector, Gadolinium, Gamma, Hydrogen, Mathematics, Method, Model, Moderator, Neutron, *Neutron scattering, Rate, Ray, Reaction, *Reaction time, Scattering, Thermal, *Thermal absorption, Time, *Time dependency.

For abstract, see S 04 13.

N66-24986 Field 20H
CFSTI Prices HC$3.00 MF$0.75
Yale Univ., New Haven, Conn.
FORMATION OF SOLAR PROMINENCES.
by P. K. Raju. 1966, 93p NASA-CR-74804
Grant NSG-176-61

Descriptors: Condensation, Conduction, Cooling, *Corona, *Coronal condensation, Equation, Formation, Heat, Instability, Linear, Nonlinearity, Oscillation, Prominence, Solar, Thermal, *Thermal instability.

For abstract, see S 04 13.

N66-25430 Field 20H
CFSTI Prices HC$2.00 MF$0.50
India. Dept. Of Atomic Energy, Bombay.
EMISSION OF LONG RANGE ALPHA PARTICLES IN FISSION.
by T. Methasiri. 1965, 44p AEET-235

Descriptors: Alpha, *Alpha particle, Binary, Drop, Emission, Evaporation, Experiment, *Fission, Liquid, Long, Model, Nuclear, *Nuclear physics, Particle, Physics, Product, Range, Reaction, Review, Survey, Ternary, Theory.

For abstract, see S 04 14.

N66-25450 Field 20H
CFSTI Prices HC$2.00 MF$0.50
Comitato Nazionale Per L Energia Nucleare, Frascati (Italy).
PASSAGE OF NEUTRONS OF ENERGY EO LESS THAN OR EQUAL TO 30 ME V IN ORDINARY CEMENT AND IN ITS COMPONENTS.
Passaggio Di Neutroni Di Energia Eo Less Than Or Equal To 30 Mev In Cemento Ordinario E Nei Suoi Componenti
by M. A. Locci, P. Picchi, and G. Verri. 16 Feb 66, 27p LNF-66/7
In Italian

Descriptors: Absorption, Aluminum, Angular, *Angular distribution, Bombardment, Calcium, Capture, Carbon, Cement, Computer, Distribution, Elastic, *Elastic scattering, Energy, Fortran, Hydrogen, Iron, Magnesium, Neutron, *Neutron bombardment, Oxygen, Potassium, Radiation, Scattering, Silicon.

For abstract, see S 04 14.

N66-25452 Field 20H
CFSTI Prices HC$2.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
PRELIMINARY STUDY OF AN ELASTIC SCATTERING EXPERIMENT TO BE PERFORMED AT ADONE.
Studio Preliminare Di Una Esperienza Di Diffusione Elastica Da Effetuarsi Ad Adone
by U. Amaldi Jr, R. Biancastelli, and P. Stein. 14 Feb 66, 27p ISS-66/2

Descriptors: Analysis, Charge, Count, Detector, Elastic, *Elastic scattering, Electrodynamics, *Electron, Energy, Magnetic field, Particle, Position, Quantum, *Quantum electrodynamics, Rate, Reaction, Scattering, Statistical, *Statistical analysis.

For abstract, see S 04 14.

N66-25800 Field 20H
CFSTI Prices HC$2.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
A PROPOSAL FOR THE INVESTIGATION OF THE PHI RESONANCE USING ADONE.
Proposta Di Una Esperiénza Da Effetuarsi Ad Adone Per Lo Studio Della Risonanza Phi
by U. Amaldi Jr, A. De gasperis, and P. Stein. 23 Dec 65, 41p ISS-65/48

Descriptors: Beam, Collision, Cross section, Decay, Electron, Elementary, *Elementary particle, Experiment, *Kaon, Machine, *Meson, Particle, *Particle decay, Phi, Polarization, Positron, *Resonance, Vacuum, Vector.

For abstract, see S 04 14.

N66-26232 Field 20H
CFSTI Prices HC$2.00 MF$0.50
Harvard Coll. Observatory, Cambridge, Mass.
CONTINUOUS ULTRAVIOLET ABSORPTION BY NEUTRAL SILICON SCIENTIFIC REPORT NO. 10.
by J. C. Rich. Apr 66, 45p NASA-CR-74908
Grant NSG-438, Contract NONR-1866/48/

Descriptors: Absorption, *Absorption coefficient, Atom, Coefficient, Continuous, Cross section, Ionization, *Ionization cross section, Neutral, *Photoionization, *Silicon, Ultraviolet.

For abstract, see S 04 14.

N66-26644 Field 20H
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
OBSERVATION OF THE ELEMENTAL ABUNDANCES IN LOW-ENERGY COSMIC RAYS IN JULY 1964.
by C. E. Fichtel, and D. Reames. Apr 66, 22p NASA-TM-X-55476, X-611-66-138

Descriptors: Abundance, Composition, Cosmic, *Cosmic ray, Element, *Element abundance, Emulsion, Flux, Low energy, Nuclear, *Nuclear emulsion, Ray, Rocket, Sounding, *Sounding rocket.

For abstract, see S 04 14.

N66-26645 Field 20H
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EXCITATION OF HYDROGEN MOLECULES BY ELECTRON IMPACT.
by S. P. Khare. Mar 66, 22p NASA-TM-X-55474, X-640-66-142

Descriptors: Born approximation, Center, Electron, *Electron impact, Electronic, *Excitation, Function, Ground, *Hydrogen, Impact, *Molecule, One, State, Wave.

For abstract, see S 04 14.

N66-26646 Field 20H
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ELECTRON-HYDROGEN IONIZATION - ASYMPTOTIC FORM OF THE WAVE FUNCTION AND THE THRESHOLD BEHAVIOUR OF THE CROSS SECTION.
by A. Temkin. 4 Feb 66, 20p NASA-TM-X-55473, X-641-66-46

Descriptors: Approximation, Asymptote, Asymptotic method, Boundary, Condition, Cross section, Dependence, Electron, *Electron ionization, Equation, Function, Hydrogen, Ionization, S-wave, Scattering, Schroedinger equation, *Threshold, Wave, *Wave function, Zero.

For abstract, see S 04 14.

N66-26647 Field 20H
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SOLAR COSMIC RAY MULTIPLY CHARGED NUCLEI AND THE JULY 18, 1961 SOLAR EVENT.
by S. Biswas, C. E. Fichtel, and D. E. Guss. Apr 66, 24p NASA-TM-X-55475, X-611-66-137

Descriptors: Acceleration, Burst, Charge, Cosmic, Energetic, Energy, Flare, Flux, Galaxy, Heavy, *Heavy nucleus, *Helium, Kinetic, Nucleus, Particle, Ray, Solar, *Solar cosmic ray.

For abstract, see S 04 14.

N66-26692 Field 20H
CFSTI Prices HC$1.00 MF$0.50
Naval School Of Aviation Medicine, Pensacola, Fla.
RADIATION MONITORING WITH NUCLEAR EMULSIONS ON PROJECT GEMINI. 1. EXPERIMENTAL DESIGN AND EVALUATION PROCEDURES - PARTIAL RESULTS ON MISSIONS 4 AND 5.
by H. J. Schaefer, and J. J. Sullivan. 18 Feb 66, 17p NASA-CR-75036, NAMI-955
Joint Rept. With Nasa

Descriptors: Anomaly, Astronaut, Atlantic, Dosimetry, Emulsion, Energy, Exposure, Gemini, *Gemini project, Hazard, Nuclear, *Nuclear emulsion, Pack, Project, Radiation, *Radiation hazard, Sensor, South, Spacecraft, Spectrum, Trap, *Trapped radiation.

For abstract, see S 04 14.

N66-26751 Field 20H
CFSTI Prices HC$2.00 MF$0.50
Maryland Univ., College Park.
GENERALIZED LANDAU KINETIC EQUATION DESCRIBING THE TRANSVERSE DIFFUSION OF A NONGYROTROPIC PLASMA COLUMN.
by M. J. Haggerty. Mar 66, 27p NASA-CR-75194, BN-443
Grant NSG-695

Descriptors: Collision, Diffusion, Distribution, *Distribution function, Electric, Field, Function, Gyrotropism, *Kinetics, Landau factor, Magnetic, *Mathematical model, Mathematics, Model, Particle, *Particle diffusion, Physics, Plasma, *Plasma physics, Theory, Transverse.

For abstract, see S 04 14.

N66-34442 Field 20H
CFSTI Prices HC$2.50 MF$0.50
Avco-Everett Research Lab., Everett, Mass.
AIR RADIATION GRAPHS - SPECTRALLY INTEGRATED FLUXES INCLUDING LINE CONTRIBUTIONS AND SELF ABSORPTION.
by R. A. Allen. Aug 66, 53p NASA-CR-556
Contracts NASW-748, DA-01-021-AMC 12005/Z/

Descriptors: Air, Atmospheric, *Atmospheric radiation, Density, Emission, Equilibrium, Flux, *Graph, Line, Model, Radiation, *Radiation emission, Rotation, Self-absorption, Spectral, Temperature.

For abstract, see S 04 20.

N66-34986 Field 20H
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EXCITATION OF H-ATOMS BY FAST PROTONS.
by I. M. Cheshire, and H. L. Kyle. Dec 65, 10p NASA-TM-X-57163, X-641-65-505
Submitted For Publication

Descriptors: Atom, *Atomic excitation, Cross section, Energy, Excitation, Fast, Ground, Hydrogen, *Hydrogen atom, Impact, *Proton, State, Table.

For abstract, see S 04 20.

N66-35140 Field 20H
CFSTI Prices HC$3.00 MF$0.75
Istituto Superiore Di Sanita, Rome (Italy).
CALCULATION OF PARTIAL WAVE ABSORPTIONS AND OF THE MODULI OF THE ELASTIC AMPLITUDES IN NUCLEON-NUCLEON SCATTERING BELOW 1.4 GE V.
by V. Amaldi Jr, R. Biancastelli, and S. Francaviglia. 16 Apr 66, 64p ISS-66/15

Descriptors: Absorption, *Absorption cross section, Amplitude, Cross, *Elastic wave, Elasticity, Electromagnetism, Elementary, *Elementary particle, Mechanics, Nucleon, *Nucleon-nucleon scattering, Partial, Particle, Physics, Quantum, *Quantum mechanics, Scattering, Section, Theoretical, *Theoretical physics, Wave.

For abstract, see S 04 20.

N66-35183 Field 20H
CFSTI Prices HC$1.00 MF$0.50
Washington Univ., St. Louis, Mo.
IS THE GRAVITON A GOLDSTONE BOSON (QUES).
by P. R. Phillips. 1966, 10p NASA-CR-77493
Grant NSG-581

Descriptors: *Boson, Description, Elementary, *Elementary particle, Ether, Experiment, *Gravitation theory, Gravity, Invariance, *Lorentz force, Model, Oscillation, Particle, Theory.

For abstract, see S 04 20.

N66-35204 Field 20H
CFSTI Prices HC$2.50 MF$0.75
General Dynamics Corp., San Diego, Calif.
NEUTRON CROSS SECTIONS FOR CADMIUM ISOTOPES TOPICAL REPORT.
by M. K. Drake. 25 Mar 66, 73p NASA-CR-54933, GA-6997
Contract SNPC-27

Descriptors: Alpha, Bibliography, *Cadmium, Cross section, Elastic, Graph, Inelasticity, *Isotope, Literature, Neutron, *Neutron cross section, Particle, Physics, Proton, Scattering, Table, Theoretical.

For abstract, see S 04 20.

N66-35290 Field 20H
CFSTI Prices HC$2.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
MEASUREMENT OF ELECTRONS MOMENTUM BY SPARK CHAMBERS IN MAGNETIC FIELD.
Misura Della Quantita Di Moto Di Elettroni, Con Camere A Scintilla Poste In Campo Magnetico
by G. Farchi. 27 Apr 66, 28p ISS-66/18
In Italian, English Summary

Descriptors: Accuracy, Chamber, Deflection, Electron, *Electron energy, Energy, Error, Field, Gap, Magnetic, *Magnetic field, Measurement, *Momentum, Spark, *Spark chamber.

For abstract, see S 04 20.

N66-35311 Field 20H
CFSTI Prices HC$1.00 MF$0.50
Chicago Univ., Ill.
RADIO CERENKOV RADIATION FROM A PRIMARY COSMIC RAY.
by I. Lerche. Oct 65, 22p NASA-CR-68058, EFINS-65-94
Grant NSG-96-60
Submitted For Publication

Descriptors: Atmosphere, Cosmic, Detection, Earth, *Earth atmosphere, Field, Line, Primary, *Primary cosmic radiation, Radiation, *Radiation field, Radio, Straight, Telescope, Velocity, Velocity field.

For abstract, see S 04 20.

N66-35315 Field 20H
CFSTI Prices HC$1.00 MF$0.50
Alabama Univ. Research Inst., Huntsville.
INTERNAL CONVERSION COEFFICIENTS FOR M4 TRANSITION FOR TELLURIUM.
by C. P. Bhalla. 1965, 18p NASA-CR-68528
Grant NSG-381
Submitted For Publication

Descriptors: Atom, Coefficient, Conversion, Eigenvalue, Internal, *Internal conversion coefficient, Nuclear, Physics, Screening, Shell, Size, *Tellurium, Theoretical, Transition.

For abstract, see S 04 20.

N66-35316 Field 20H
CFSTI Prices HC$3.00 MF$0.75
Maryland Univ., College Park.
NONADDITIVITY OF INTERMOLECULAR FORCES - EFFECTS ON THE THIRD VIRIAL COEFFICIENT.
by A. G. De rocco, E. A. Mason, and A. E. Sherwood. 15 Oct 65, 62p NASA-CR-68696, IMP-NASA-52
Grant NSG-5-59
Submitted For Publication

Descriptors: Additive, Body, Coefficient, Dispersion, Energy, Force, Intermolecular, Model, Molecular, *Molecular physics, Perturbation, *Perturbation theory, Physics, Potential, Repulsion, Theorem, Theory, Third, Three, Virial, *Virial theorem.

For abstract, see S 04 20.

N66-35320 Field 20H
CFSTI Prices HC$1.00 MF$0.50
Wisconsin Univ., Madison.
THE GROUND STATE ENERGY OF A MOLECULE IN THE ADIABATIC APPROXIMATION.
by S. T. Epstein. 25 Aug 65, 5p NASA-CR-68755, WIS-TCI-118
Grant NSG-275-62
Submitted For Publication

Descriptors: Adiabat, *Adiabatic equation, Approximation, Energy, Equation, Ground, *Ground state, *Molecular energy, Molecule, Principle, State, Variation.

For abstract, see S 04 20.

N66-35322 Field 20H
CFSTI Prices HC$3.25 MF$1.25
Avco-everett Research Lab., Everett, Mass.
AIR RADIATION TABLES - SPECTRAL DISTRIBUTION FUNCTIONS FOR MOLECULAR BAND SYSTEMS.
by R. A. Allen. Aug 66, 194p NASA-CR-557
Contracts NASW-748, DA-01-021-AMC-12005/Z/

Descriptors: Air, Atmospheric, *Atmospheric radiation, Carbon, Diatomic, *Diatomic molecule, Distribution, Energy, Function, Graph, Molecular, *Molecular spectrum, Nitrogen, Oxygen, Radiation, Spectral, *Spectral energy distribution, Spectrum, Table.

For abstract, see S 04 20.

PB-172 875 Field 20H
CFSTI Prices: HC$5.60 MF$0.50
Laboratoire de l'Accelerateur Lineaire, Universite de Paris, Orsay (France).
180 DEGREE POSITRON-ELECTRON SCATTERING AT 200 AND 500 MeV.
by A. Browman, B. Grossetete, and D. Yount.
Apr 66, 53p LAL-1146

Descriptors: (*Electrons, *Nuclear scattering), (*Positrons, Nuclear scattering), Nuclear cross sections, Field theory, Elastic scattering, Nuclear spectroscopy, France.

To test the predictions of quantum electrodynamics, absolute and relative measurements of the positron-electron scattering cross-section were made at 200 and at 500 MeV. Recoil electrons were detected with the spectrometer at 0 degrees with respect to the incident beam direction; and for the range of recoil momenta studied, the elastic scattering cone was entirely contained in the angular acceptance of the spectrometer. The shape of the recoil spectrum near the incident positron momentum is consistent with the theory if the radiative corrections of the form (1 +delta) were used; the shape is in less good agreement if the correction had the form exp (delta). The most precise measurements made, where the corrections were about 15 %, were in agreement with the theory. The accuracy has to be increased to decide between exp (delta) and (1 +delta). If radiative corrections are assumed to be precisely known, the experiment determines 1/K to about 0.6 F.

AD-638 767 See Field 7D

AD-638 827 See Field 20J

AD-638 830 See Field 7D

AD-638 905 See Field 4A

AD-638 953 See Field 20J

AD-639 002 See Field 20C

AD-639 025 See Field 3A

AD-639 196 See Field 7D

AD-639 271 See Field 20L

AD-639 272 See Field 6C

AD-639 310 See Field 20J

AD-639 313 See Field 20J

AD-639 316 See Field 20J

AD-639 452 See Field 20J

AD-639 453 See Field 20J

AD-639 535 See Field 20J

AD-639 543 See Field 20J

AD-639 544 See Field 20J

AD-639 545 See Field 20J

AD-639 546 See Field 20J

AD-639 547 See Field 20J

AD-639 549 See Field 20J

AD-639 550 See Field 20J

AD-639 571 See Field 20J

N66-35040 See Field 9B

N66-35041 See Field 9B

N66-35085 See Field 9B

N66-35107 See Field 20L

20I. PLASMA PHYSICS

AD-638 783 Field 20I, 20N
Not available from CFSTI.
Oslo Univ. (Norway). Inst. of Theoretical Astrophysics.
COLLISION EFFECTS IN HYDROMAGNETO-IONIC THEORY.
Revised ed.
by Hari K. Sen, and Arne A. Wyller. 8 Jun 64, 18p Scientific-10
Contract AF 61 (052)-743
AFCRL-66-592
Prepared in cooperation with Williamson Development Co., Inc., West Concord, Mass. Revision of manuscript received 25 May 64.
Availability: Published in Radio Science Journal of Research NBS/USNCURSI v69D n1 p95-109 Jan 1965.

Descriptors: (*Magnetohydrodynamics, Transport properties), (*Electromagnetic waves, Propagation), Theory, Plasma medium, Magnetic fields, Ions, Motion.

A hydromagneto-ionic theory has been developed within the framework of the Burgers formalism (1958a) which is a microscopic theory based on moments of the Boltzmann transport equation. The effects on electromagnetic wave propagation of electron-electron and electron-proton collisions have been considered to the order of Chapman and Cowling's second approximation. The present theory is an extension of the magneto-ionic theory derived earlier by one of the authors (Wyller, 1961) for a fully ionized hydrogen plasma, in that it includes the effects of ion motions. The theory is therefore applicable to the high as well as the low frequency modes of wave propagation, such as the whistler, Alfven, and the retarded magneto-acoustic modes. Expressions have been derived for the refractive index, absorptivity, the wave polarization, and the zeros and infinities of the refractive index. Numerical applications have been given for the four characteristic modes of low frequency wave propagation, viz, the whistler mode, lower hybrid frequency, ion gyroresonance, and the hydromagnetic mode. Applications of the theory to the solar corona, and future extensions to the terrestrial ionosphere have been indicated. (Author)

AD-638 838 Field 20I
Not available from CFSTI.
Aerospace Research Labs., Office of Aerospace Research, Wright-Patterson AFB, Ohio.
WAVE NATURE OF MOVING STRIATIONS.
by D. A. Lee, P. Bletzinger, and A. Garscadden.
9 Apr 65, 13p ARL-66-0128
Proj. AF-7071
Availability: Published in Journal of Applied Physics v27 n1 p377-87 Jan 1966.

Descriptors: (*Plasma oscillations, Stability), Glow discharges, Pressure, Pulse modulation, Equations.

Identifiers: Stratified media.

The results are presented of time- and space-resolved measurements on self-excited moving striations and on the response of the positive column of a low-pressure glow discharge to externally excited pulses. From these the profile, structure, and the backward-wave nature of moving striations are clearly indicated. A new method of solution to the equation originally presented by Pekarek is shown to contain all of the experimental results, including the dispersion of a pulse disturbance. A stability criterion is derived; especially useful is that the onset of striations in a discharge can be calculated from a simple quadratic equation. The coupling with other oscillations in the plasma is investigated and it is shown that they cause phase modulation and mode jumping. (Author)

AD-638 962 Field 20I
Not available from CFSTI.
Socony Mobil Oil Co., Inc., Princeton, N. J. Central Research Div. Lab.
SPATIALLY RESOLVED DENSITY MEASUREMENTS OF DEUTERIUM PLASMA USING ENERGETIC D (+) BEAM.
by R. L. Hickok, F. C. Jobes, and J. F. Marshall.
16 Dec 65, 9p
Contract AF 49 (638)-1500
Proj. AF-9752
Task 975201
AFOSR-66-1766
Availability: Published in The Review of Scientific Instruments v37 n5 p591-5 May 1966.

Descriptors: (*Plasma medium, Density), (*Deuterium, Plasma medium), Measurement, Deuteron beams.

The density distribution of cylindrically symmetric deuterium plasmas can be measured by probing the plasma with an energetic deuterium beam and observing the protons from the D (d,p)T reaction. This technique measures the absolute deuterium density with good spatial resolution and is independent of the electron and ion velocity distributions. Using this method, we determined to within 10% the density distributions of a high current deuterium arc for three different operating conditions. A comparison of these density distributions with optical intensity distributions shows that the optical intensity decreases faster with radius than the deuterium density. (Author)

AD-639 010 Field 20I
Not available from CFSTI.
Astro-Electronics Div., Radio Corp. of America, Princeton, N. J.
ACCELERATION OF AN ELECTRON CYCLOTRON PLASMA BY SELF GENERATED ELECTRIC FIELDS.
by H. W. Hendel, S. A. Ahmed, and T. J. Faith.
1964, 8p
Contract AF 49 (638)-1342
Proj. AF-9752
Task 975201
AFOSR-66-1101
Availability: Published in Proceedings of the International Colloquium on the Interaction of High Frequency Fields Associated with Static Magnetic Field Plasma, Saclay (France) 16-17 Sep 1964.

Descriptors: (*Plasma accelerators, *Electric fields), Cyclotron resonance phenomena, Acceleration, Plasma medium, Space charges.

The paper is concerned with the continuous acceleration of a neutral plasma by self-generated electrostatic fields. Energy input to the plasma is achieved by selective transfer of rf energy to the electrons at electron cyclotron resonance. With the density in the acceleration region adjusted, the mean path (parallel to the magnetic field) of the electrons between collisions is greater than the Larmor radius (the latter determining the mean free path transverse to B sub Z. Due to the tensor nature of the electron diffusion coefficient in the presence of a magnetic field at low pressures, an electron space charge is set up by the axial electron flux that accelerates the ions axially. To maintain charge neutrality in the beam that emerges from the accelerator and to conserve momentum, the ion accelerating plasma potential drop must be nearly totally reflective for the electrons and therefore adjusts to a value approximately 6 times higher than the electron temperature. Consequently the final ion energy in the beam is 6 times the thermal energy of the plasma electrons. (Author)

AD-639 012 **Field 20I**
Not available from CFSTI.
Astro-Electronics Div., Radio Corp. of America, Princeton, N. J.
PLASMA ACCELERATION BY ELECTRON CYCLOTRON RESONANCE.
by H. Hendel, T. Faith, and E. C. Hutter. 1965, 21p
Contract AF 49 (638)-1342
Proj. AF-9752
Task 975201
AFOSR-66-1100
Presented at Symposium on Advanced Propulsion (4th), Palo Alto, Calif., Apr. 26, 1965.
Availability: Published in RCA Review v26 n2 p200-16 Jun 1965.

Descriptors: (*Plasma accelerators, *Cyclotron resonance phenomena), Acceleration, Plasma medium, Langmuir probes, Space charges, Thrust, Space propulsion.

Results are presented for a continuously operating electron cyclotron resonance plasma accelerator at a frequency of 2.45 kilomega-cycles with absorbed power levels up to 0.5 kilowatt. Langmuir-probe measurements indicate that a space-charge field set up by energetic electrons (electron temperatures from 5 to 25 ev) accelerates plasma ions to energies of from 35 to 150 ev, as measured by a retarding-field ion-energy analyzer. The final ion energy shows a linear relationship to the electron temperature, in agreement with the theory. Strong electron confinement along magnetic field lines is observed in the discharge region. At powers up to 10 watts, approximately 30% of the absorbed microwave power is converted into kinetic energy of the ions when a magnetic bottle is formed at the rear of the accelerator. When a similar bottle is used with a power of 0.5 kilowatt, the efficiency falls to 4%. The specific impulse, efficiency, and thrust attainable from a thruster based on electron cyclotron resonance are in the useful range for space-propulsion applications, especially in orbit-corrective missions. The absence of sensitive accelerating or electron-emitting electrodes promises long lifetime for such a thruster. (Author)

AD-639 057 **Field 20I**
CFSTI Prices: HC$4.00 MF$0.75
California Inst. of Tech., Pasadena.
A NONLINEAR STUDY OF BEAM PLASMA AMPLIFICATION.
Technical rept.
by Robert L. Poeschel. Sep 66, 123p TR-33
Contract Nonr-220 (50)

Descriptors: (*Plasma oscillations, *Electron beams), Nonlinear systems, Frequency, Dielectrics, Space charges, Velocity.

The interaction between an electron beam and the plasma oscillations it excites in traversing a plasma region effectively changes the magnitude and direction of the force between beam electrons. The beam behavior is studied theoretically by computing in an exact, nonlinear manner, the trajectories of a disc model electron beam which traverses a linear, dielectric model plasma. The parameters varied are the beam space charge conditions (beam current), the degree of initial velocity modulation, and the ratio of modulation frequency to plasma frequency. Computations show that iit is possible to bunch the beam electrons to within 85% of delta function bunching under some beam and plasma conditions. The electron beam behavior is studied experimentally by observing the beam electron velocity phase distribution with a crossed-field velocity analyzer, and observing the beam current waveform (density-phase distribution) using a wide-band sampling oscilloscope. Experimental results show essentially the same beam behavior as predicted by the computations with some differences which are attributed to variation in the plasma density along the beam path. (Author)

AD-639 210 **Field 20I**
CFSTI Prices: HC$1.00 MF$0.50
Stanford Univ., Calif. Inst. for Plasma Research.
BEAM/PLASMA INTERACTION WITH TRANSVERSE MODULATION.
Internal memo.
by E. E. Abraham, F. W. Crawford, and D. M. Mills. Aug 66, 6p SU-IPR-88
Contract DA-28-043-AMC-02041 (E)

Descriptors: (*Plasma medium, *Electron beams), Modulation.

The paper presents computations for a finite beam in a finite plasma, indicating that the predicted growth rates for axisymmetric and transverse modulation are generally comparable, and describes some conclusive observations of growth in the transverse mode. Operation in this mode offers a possibility of overcoming the usual coupling difficulties of microwave beam/plasma amplifiers. A novel resonant coupling scheme being studied at Stanford is discussed. (Author)

AD-639 211 **Field 20I, 17B, 9E**
CFSTI Prices: HC$2.00 MF$0.50
Stanford Univ., Calif. Inst. for Plasma Research.
A STATUS REVIEW OF MICROWAVE PLASMA DEVICE RESEARCH.
by F. W. Crawford. Mar 66, 41p SU-IPR-57
Contract DA-28-043-AMC-02041 (E)
Presented at the IEEE PGED Meeting, San Francisco, Calif., Mar 66.

Descriptors: (*Microwave equipment, *Plasma physics), Reviews, Plasma medium, Phase shifters, Attenuators, Tuning devices, Filters (Electromagnetic wave), Waveguide couplers, Electrostatics, Electromagnetic waves, Harmonic generators, Oscillators, Parametric amplifiers, Microwave frequency.

The paper discusses some of the obstacles to device development that have been encountered along the way, and some of the paths that are being taken to circumvent them.

AD-639 249 **Field 20I**
Not available from CFSTI.
Texas Univ., Austin.
HELICAL STRUCTURES IN RF PLASMAS.
by C. J. Ransom, and H. Schulter. 1963, 10p
Grant DA-ARO (D)-31-124-G438
AROD-4159:6
Availability: Published in Proceedings of International Conference on Ionization Phenomena In Gases (6th) (S.E.R.M.A.) Paris v2 p501 1963.

Descriptors: (*Plasma physics, Cyclotron resonance phenomena), Gas discharges, Radiofrequency, Hydrogen, Magnetic fields.

With a 30 Mc oscillator, electrodeless hydrogen discharges are created in a magnetic bottle configuration. In the azimuthal direction around the axis of the magnetic field a set of striation-like plasma arms are observed. The arms are twisted around the axis of the magnetic field and rotate around this axis, except for certain critical field strengths. The rotation frequency decreases rapidly with increasing magnetic field strength, passes through zero, and increases again. At the critical magnetic field strengths the sense of rotation is reversed. (Author)

AD-639 263 **Field 20I, 14B**
Not available from CFSTI.
Columbia Univ., New York. Plasma Lab.
MAGNETIC FIELD MEASUREMENT IN AN ELECTROMAGNETIC SHOCK TUBE USING LARGE AREA PROBES.
by Bennett Miller. 16 Aug 65, 8p
Contract AF 49 (638)-1254
Proj. AF-9752
Task 975201
AFOSR-66-1799
Availability: Published in The Review of Scientific Instruments v37 n1 p7-11 Jan 1966.

Descriptors: (*Magnetic fields, *Shock tubes), (*Plasma physics, Magnetic fields), Electromagnetic fields, Probes.

The author examines the problem of measuring with a probe the magnetic field in a plasma which is moving with respect to the probe. It is shown that integration with respect to time is, in general, not proper and we develop correct expressions for the case of a current conducting plasma produced by a strong ionizing shock wave in an electromagnetically driven shock tube. Use of the correct expressions is described for large area magnetic field probes employed in a coaxial electromagnetic shock tube. The results demonstrate the need for careful interpretation of data obtained from magnetic field probes used to measure magnetic fields in moving media. (Author)

AD-639 343 **Field 20I**
CFSTI Prices: HC$1.00 MF$0.50
Innsbruck Univ. (Austria). Inst. for Theoretical Physics.
DISCONTINUITIES IN NON-IDEAL MAGNETO-GASDYNAMICS.
by H. Friedel. 27 Jun 66, 18p Scientific-30
Contract AF 61 (052)-675
AFOSR-66-1862

Descriptors: (*Magnetohydrodynamics, One-dimensional flow), Equations of motion, Theory, Boundary value problems, Austria.

The well known evolutionary condition of ideal MGD is extended to non-ideal, one-dimensional MGD characterized by arbitrary dissipation terms. It is shown that in this case discontinuities may exist fulfilling the evolutionary condition. Concluding the case of a dissipation term due to finite electrical conductivity and its effect on contact discontinuities is investigated. These discontinuities are found to be non-evolutionary and therefore physically meaningless. (Author)

AD-639 428 **Field 20I**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
MEASURING THE AVERAGE ELECTRON ENERGY LOSSES DURING THE DIFFUSION OF THE ELECTRON BEAM IN PLASMA.
by L. L. Pasichnyk. 17 Jun 66, 10p FTD-TT-65-1920
TT-66-62333
Unedited rough draft trans. of Ukrayinskyi Fizychnyi Zhurnal (USSR) v9 n9 p1027-30 1964.

Descriptors: (*Electron beams, Energy), (*Plasma medium, Electron beams), Diffusion, Reduction, USSR, Measurement.

The experimental data given shows that at an abnormally strong reaction of the beam with plasma.

the electrons of the beam lose up to 20% of their initial energy. A method for measuring this loss is described.

AD-639 527 **Field 20I, 20D**
Not available from CFSTI.
Strathclyde Univ., Glasgow (Scotland). Dept. of Mathematics.
ANISENTROPIC ONE-DIMENSIONAL UNSTEADY MAGNETOGASDYNAMIC FLOW.
by J. B. Helliwell. 1963, 21p
Grant AF-EOAR-6-64
Proj. AF-9749
Task 974901
AFOSR-66-0049
Availability: Published in Journal of Mathematics and Mechanics v14 n4 p523-40 Jul 1965.

Descriptors: (*Magnetohydrodynamics, One-dimensional flow), Partial differential equations, Great Britain.

The investigation relates to the rectilinear adiabatic but non-isentropic flow of a perfectly conducting ideal gas with constant polytropic index moving in the presence of a transverse magnetic field. The influences of viscosity, heat conduction and radiation are all supposed negligible. As an example of such a flow one may consider the situation arising when an expansion wave overtakes and interacts with a shock wave thereby causing it to decay. The exact equations of nonisentropic magnetogasdynamic flow are discussed and alternative forms of the characteristic equations derived. It is shown that by the use of Naylor's modified stream function the general problem may again be reduced to the solution of a single quasi-linear partial differential equation which, as a generalization of the case of ordinary gasdynamics, possesses special integrals only for suitable distributions of both the entropy and magnetic field strength. Solutions analogous to Martin and Ludford's degenerate 'simple wave' forms are also discussed. (Author)

AD-639 552 **Field 20I**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
DISPERSAL OF CONDUCTING GAS BY A RUNNING MAGNETIC FIELD.
by V. B. Baranov. 21 Jun 66, 12p FTD-TT-65-1476
TT-63-12218
Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika i Mashinostroenie n4 p14-8 1960.

Descriptors: (*Magnetohydrodynamics, Mathematical analysis), Acceleration, USSR.

AD-639 593 **Field 20I**
CFSTI Prices: HC$4.00 MF$0.75
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
A MAGNETOHYDRODYNAMIC FLOW IN THE SHOCK TUBE BOUNDARY LAYER WITH TRANSVERSE MAGNETIC FIELD.
Technical rept.
by J. K. Dukowicz. Jul 66, 107p UTIAS-115
Grant AF-AFOSR-366-65

Descriptors: (*Magnetohydrodynamics, *Boundary layer), Hall effect, Shock tubes, Magnetic fields, Heat transfer, Canada.

Some cases of boundary layer flow in a shock tube with insulated walls and a transverse magnetic field are investigated experimentally and theoretically. The configuration is similar to the insulator boundary layer in an MHD generator channel with a loading parameter equal to unity. With argon as the test gas, the experimental results show some cases where the heat flux to the wall is uninfluenced by the magnetic field, and others where a strong effect is observed. A Couette flow calculation, incorporating all relevant physical phenomena and representing the conditions encountered in the experiment, was carried out. The results indicate that the Hall effect has an important influence in such a way that when Hall currents are unrestricted there is little change in the heat flux. The strong interaction observed may be explained by the absence of Hall currents, or possibly by the occurrence of an electron thermal instability predicted by Kerrebrock at high Hall parameters. (Author)

N66-24402 **Field 20I**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EXTENSION OF THE FOKKER- PLANCK EQUATION.
by J. C. Price. Mar 66, 18p NASA-TM-X-55466, X-641-66-96

Descriptors: Amplitude, *Collision, Derivation, Equation, Extension, *Fokker-planck equation, Planck equation, Plasma, *Plasma wave, Small, Term, Uniform, Wave.

For abstract, see S 04 13.

N66-24405 **Field 20I**
CFSTI Prices HC$2.00 MF$0.50
Geophysics Corp. Of America, Bedford, Mass. Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SPUTTERING ION SOURCE FINAL REPORT, 29 MAR. - 30 SEP. 1963.
by R. F. Herzog, and H. J. Liebl. 1963, 42p
NASA-CR-74626, GCA-TR-63-7-G
Contracts NAS7-100, JPL-950576
Prepared For Jpl

Descriptors: Accelerator, Analysis, Beam, Bombardment, *Duoplasmatron, Electron, *Electron bombardment, Ion, *Ion source, Magnet, Material, Modification, Solid, Source, *Sputtering.

For abstract, see S 04 13.

N66-24425 **Field 20I, 20L**
CFSTI Prices HC$3.00 MF$0.75
Nihon Univ., Tokyo (Japan).
ATOMIC ENERGY RESEARCH INSTITUTE OF NIHON UNIVERSITY ANNUAL REPORT, 1965.
1965, 89p NUP-66-7

Descriptors: Density, Electron, Elementary, Experiment, Field, Flow, Gas, Intermetallics, Magnetic, Particle, Physics, Pinch, Plasma, *Plasma physics, Property, Quantum, Research, Solid, *Solid state physics, State, Superconductor, *Theoretical physics, Theory, Theta.

For abstract, see S 04 13.

N66-24584 **Field 20I**
CFSTI Prices HC$4.00 MF$0.75
Case Inst. Of Tech., Cleveland, Ohio.
AN EXPERIMENTAL STUDY OF THE RELATIONSHIP BETWEEN MOVING STRIATIONS AND PLASMA-ACOUSTIC WAVES.
by D. A. Meskan. 1965, 105p NASA-CR-74607, A-40
Grant NSG-198

Descriptors: Acoustic, Amplitude, Argon, Cathode, Column, Current, Density, Discharge, Dispersion, Electron, Fluid, Glow, *Glow discharge, Hot, *Hot cathode, Intensity, Light, *Light intensity, Linear, Low pressure, Model, Moving, Plasma, *Plasma wave, Positive, Striation, Temperature, Velocity, Wave.

For abstract, see S 04 13.

N66-24713 **Field 20I**
CFSTI Prices HC$2.60 MF$0.50
Innsbruck Univ. (Austria).
GAS DYNAMIC METHODS IN MHD FLOW SUMMARY REPORT NO. 2 (FINAL), 1 JAN. 1963 - 31 DEC. 1965.
by F. Cap, F. Herrnegger, G. Kerer, K. Lackner, and R. Skarics. 3 Jan 66, 22p AFOSR-66-0405, AD-628917
Contract AF 61/052/-675

Descriptors: Acceleration, Analysis, Conductivity, Dimensional, Electric, Equation, Flow, Generator, Linear, Magnetohydrodynamic, *Magnetohydrodynamic generator, Method, Numerical, One, Physics, Plasma, *Plasma conductivity, *Plasma flow, Power, Two.

For abstract, see S 04 13.

N66-24868 **Field 20I**
CFSTI Prices HC$2.00 MF$0.50
Japan Atomic Energy Research Inst., Tokyo.
EXPERIMENTS ON THE PLASMA FLOW PAST BODIES IN A MAGNETIC FIELD (I).
by N. Kawashima, and S. Mori. Jul 65, 30p
JAERI-1999

Descriptors: Body, Collisionless, *Collisionless plasma, Density, Downstream, Field, Flow, Gun, Hydromagnetic, Hydromagnetic wave, Interaction, Magnetic, *Magnetic field, Measurement, Plasma, *Plasma flow, Propagation, Shock, *Shock wave, Structure, Temperature, Upstream, Velocity, Wake, Wave.

For abstract, see S 04 13.

N66-24871 **Field 20I**
CFSTI Prices HC$2.00 MF$0.50
Nagoya Univ. (Japan).
RESONANCES OF RADIO FREQUENCY PROBE IN A PLASMA.
by H. Ikezi, and K. Takayama. Mar 66, 27p IPPJ-48

Descriptors: Calculation, Collision, Current, Damping, Density, Discharge, Electron, *Electron temperature, Frequency, Impedance, Numerical, Plasma, *Plasma frequency, Probe, Radio, *Radio frequency impedance probe, Resonance, *Resonance probe, Resonant, *Resonant frequency, Sheath, Temperature, Theory, Tube.

For abstract, see S 04 13.

N66-24902 **Field 20I**
CFSTI Prices HC$1.00 MF$0.50
Kyoto Univ. (Japan).
LANGMUIR PROBE MEASUREMENTS IN AN ARGON PLASMA FLOW.
by G. Kamimoto, and M. Nishida. Nov 65, 24p CP-8

Descriptors: Argon, *Argon plasma, Calculation, Density, Electron, *Electron temperature, Evaluation, Flow, Ion, *Ion density, Jet, *Langmuir probe, Measurement, Plasma, *Plasma jet, Probe, Property, Temperature.

For abstract, see S 04 13.

N66-24910 **Field 20I**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
USE OF THE EMISSION SPECTRUM OF THE COPPER ATOM FOR PLASMA DIAGNOSTICS.
Ispol'zovaniye Spektra Ispuskaniya Atoma Medi Dlya Diagnostiki Alazmy
by G. I. Bakanovich, and L. I. Grechikhin. Apr 66, 13p NASA-TT-F-10067
Transl. Into English From Teplofiz. Vysokikh Temperatur, Akad. Nauk Sssr (Moscow), V. 3, No. 4, 1965 P 520-523

Descriptors: Arc, Charge, *Charged particle, Concentration, *Copper, Current, Dc, Diagnostics, Direct, *Direct current (dc), Electric, *Electric arc, Emission, *Emission spectrum,

Particle, Plasma, *Plasma temperature, Spectrum, Temperature.

For abstract, see S 04 13.

N66-24948 **Field 20I**
CFSTI Prices HC$1.00 MF$0.50
Chicago Univ., Ill.
THE RELATIVISTIC GARDENHOSE INSTABILITY, II.
by I. Lerche. 1966, 25p NASA-CR-74801, EFINS-66-36
Grant NSG-96-60

Descriptors: Distribution, *Distribution function, Dynamics, Electron, Field, Frequency, Function, Homogeneity, Instability, Low frequency, Magnetic, *Magnetic field, Plasma, *Plasma instability, Relative, Stream, Velocity, Wavelength.

For abstract, see S 04 13.

N66-24978 **Field 20I**
CFSTI Prices HC$3.00 MF$0.75
Northrop Space Labs., Huntsville, Ala.
THE VLASOV EQUATIONS.
by C. K. Chou. Nov 65, 89p NASA-CR-74673, E20-151
Contract NAS8-11440
Its Tech. Mem. No. 137

Descriptors: Dynamics, Electrodynamics, Electron, Gas, Hydrodynamics, Kinetic, Liouville equation, Mechanics, Plasma, *Plasma dynamics, Statistical, *Statistical mechanics, Theory, *Vlasov equation.

For abstract, see S 04 13.

N66-25013 **Field 20I**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
FLOW OF PLASMA IN A SLIGHTLY ROTATIONAL MAGNETIC FIELD.
by Y. Hiroshige. 10 Aug 62, 17p NASA-CR-74848, JPL-TM-33-96
Contract NAS7-100

Descriptors: Conductivity, Differential, Electric, Ellipse, Equation, Field, Flow, Incompressible, *Incompressible flow, Inviscid, *Inviscid flow, Magnetic, Partial, Plasma, *Plasma flow, Rotating, Solar, *Solar magnetic field.

For abstract, see S 04 13.

N66-25199 **Field 20I**
CFSTI Prices HC$3.00 MF$0.75
Toronto Univ. (Ontario).
MILLIMETER WAVE HARMONIC GENERATION IN A PLASMA.
by V. Lavks. Nov 65, 66p
Contract DRB-G-5540-02
Its Res. Rept. No. 39

Descriptors: Development, Discharge, Gas, *Gas discharge, Generation, Generator, Harmonic, *Harmonic generator, Millimeter, *Millimeter wave, Plasma, *Plasma generation, Wave, Wavelength.

For abstract, see S 04 13.

N66-25528 **Field 20I**
CFSTI Prices HC$2.00 MF$0.50
Chicago Univ., Ill.
NONSYMMETRIC INFLATION OF A MAGNETIC DIPOLE.
by E. N. Parker. Apr 66, 39p NASA-CR-74869, EFINS-66-31
Grant NSG-96-60
Submitted For Publication

Descriptors: *Dipole, Dissipation, Distortion, Distribution, Energy, Field, Gas, *Inflation, Ionized, *Ionized gas, Ionosphere, Layer, Magnetic, *Magnetic field, Particle.

For abstract, see S 04 14.

N66-26123 **Field 20I**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
THE DETECTION OF THE PLASMA COMPONENT OF MAGNETOHYDRODYNAMIC WAVES IN SPACE.
by M. Neugebauer. 12 Jun 62, 32p NASA-CR-74996, JPL-TM-33-93
Contract NAS7-100

Descriptors: Blind, Density, Detector, Field, Interplanetary, *Interplanetary space, Low frequency, Magnetic, *Magnetic field, Magnetohydrodynamic, *Magnetohydrodynamic wave, Plasma, *Plasma density, Profile, Space, Spot, Time, Wave.

For abstract, see S 04 14.

N66-26254 **Field 20I**
CFSTI Prices HC$1.00 MF$0.50
Chicago Univ., Ill.
LANDAU DAMPING AND DEBYE SHIELDING.
by P. D. Noerdlinger. 1966, 25p NASA-CR-75042, EFINS-66-45
Grant NSG-96-60

Descriptors: Collisionless, *Collisionless plasma, *Debye function, Distribution, Electron, Electrostatic, *Electrostatic shielding, Function, Ion, *Landau damping, Perturbation, Physics, Plasma, *Plasma physics, Ratio, Shielding, Temperature.

For abstract, see S 04 14.

N66-26697 **Field 20I**
CFSTI Prices HC$1.00 MF$0.50
Chicago Univ., Ill.
UNSTABLE MAGNETOSONIC WAVES IN A RELATIVISTIC PLASMA.
by I. Lerche. 1966, 25p NASA-CR-75027, EFINS-66-43
Grant NSG-96-60

Descriptors: Cosmic, Disk, Electromagnetic, *Electromagnetic wave, Electron, Equation, Field, Instability, Linear, *Linear equation, Magnetic, *Magnetic field, Magnetosonic, Plasma, Proton, Ray, Relative, *Relativistic plasma, Thermal, Wave.

For abstract, see S 04 14.

N66-26698 **Field 20I**
CFSTI Prices HC$2.00 MF$0.50
Maryland Univ., College Park.
ATOMIC PROCESSES IN PLASMAS.
by T. D. Wilkerson. Oct 65, 34p NASA-CR-75078, BN-407
Grants NSG-283, NSG-359

Descriptors: Atom, *Atomic collision, Coefficient, Collision, Electron, Interaction, Line, Measurement, Particle, Photon, Physics, Plasma, Plasma-particle interaction, Radiation, *Radiation measurement, Spectrum.

For abstract, see S 04 14.

N66-34577 **Field 20I**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
SUPERCONDUCTING MAGNETIC BOTTLE FOR PLASMA PHYSICS EXPERIMENTS.
by W. D. Coles, J. C. Fakan, and J. C. Laurence. Aug 66, 15p NASA-TN-D-3595
Contract 129-02-05-10-22

Descriptors: Bottle, Cable, Coil, Construction, *Container, Design, Experiment, Field, Magnet, Mirror, Niobium, Physics, Plasma, *Plasma physics, Production, *Superconducting magnet, Zirconium.

For abstract, see S 04 20.

N66-34699 **Field 20I**
CFSTI Prices HC$2.00 MF$0.50
Stanford Research Inst., South Pasadena, Calif.
ON THE INTERPRETATION OF IONOSPHERIC RESONANCES STIMULATED BY ALOUETTE I.
by F. W. Crawford, R. S. Harp, and T. D. Mantei. May 66, 38p NASA-CR-77356, IPR-75
Contract NGR-05-020-077

Descriptors: *Alouette i satellite, Delay, Electrostatic, *Electrostatic plasma, Energy, Group, *Ionosphere, Perturbation, Plasma, *Plasma wave, Propagation, Resonance, Ring, Wave.

For abstract, see S 04 20.

N66-35020 **Field 20I**
CFSTI Prices HC$2.00 MF$0.50
Avco-everett Research Lab., Everett, Mass.
ON THE EQUILIBRIUM OF ELECTRON CLOUDS IN TOROIDAL MAGNETIC FIELDS.
by J. D. Daugherty, and R. H. Levy. May 66, 33p NASA-CR-77387, AVCO-EVERETT RES. REPT.-248
Contracts NAS8-20310, AF 49/638/-1553
Submitted For Publication

Descriptors: Charge, Cloud, Drift, Electric, Electron, *Electron cloud, *Equilibrium, Field, Image, Low density, Magnetic, *Magnetic field, Neutral, Plasma, Space, Toroid.

For abstract, see S 04 20.

N66-35323 **Field 20I**
CFSTI Prices HC$1.00 MF$0.50
Rensselaer Polytechnic Inst., Troy, N. Y.
TRANSPORT PHENOMENA IN IONIZED GASES AS AN INITIAL VALUE PROBLEM.
by E. H. Holt, and D. A. Huchital. Sep 66, 11p NASA-CR-559
Grant NSG-48

Descriptors: Boltzmann equation, Diffusion, Electric, Electron, Field, Fourier transform, Free, Gas, *Gas transport, Initial, *Initial value problem, *Ionized gas, Laplace transform, Phenomenon, Plasma, Problem, Transport, Value.

For abstract, see S 04 20.

AD-638 803 **See Field 20N**

AD-639 334 **See Field 20C**

AD-639 423 **See Field 14B**

AD-639 526 **See Field 21B**

N66-35252 **See Field 13I**

20J. QUANTUM THEORY

AD-638 827 **Field 20J, 20H**
Not available from CFSTI.
Lyman Lab. of Physics, Harvard Univ., Cambridge, Mass.
DENSITY OPERATORS FOR COHERENT FIELDS.
by U. M. Titulaer, and R. J. Glauber. 19 Nov 65, 12p
Contract AF 49 (638)-1380
Proj. AF-9751
Task 975101
AFOSR-66-1690

Availability: Published in The Physical Review v145 n4 p1041-50 May 27 1966.

Descriptors: (*Field theory, *Operators (Mathematics)), Quantum mechanics, Annihilation reactions, Density, Coherent scattering.

The authors study the forms which the conditions for coherence impose upon the density operators for electromagnetic fields. All fields possessing first-order coherence, they show, may be regarded as ones in which only a single mode is excited; this mode neet not, however, be a monochromatic one. The higher order coherence conditions may be regarded as specifying certain moments of the distribution of the number of photons in the single excited mode. Full coherence, in particular, is shown to require that the number of photons present follow a Poisson distribution. The class of fields which possess full coherence is shown to be larger than the class of eigenstates of the annihilation operators. The unique character of the eigenstates, on the other hand, is demonstrated by means of a number of simple theorems. (Author)

AD-638 828 **Field 20J**
Not available from CFSTI.
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
IMPROVED METHOD FOR QUANTUM MECHANICAL THREE-BODY PROBLEMS. II. REPULSIVE POTENTIALS.
Physical sciences research papers.
by Leonard Eyges. 23 Sep 65, 15p AFCRL-66-548, AFCRL-PSRP-256
Proj. AF-5621
Task 562106
Availability: Published in Journal of Mathematical Physics v7 n5 p938-48 May 1966.

Descriptors: (*N-body problem, *Quantum mechanics), Potential theory, Wave functions.

The author extends a method previously presented for the three-body problem with attractive interparticle potentials to the case of repulsive interparticle potentials, with periodic boundary conditions on each particle. As before, he decomposes the wave function into three parts, and from the Schrodinger equation write equations for these parts. He observes that, in one-dimension and for delta-function potentials, these equations can be easily solved numerically, and we present these solutions for potential 'strengths' ranging from zero to infinity. He then discusses a more general method for solving these equations, which method involves expansions in a certain set of two-body functions. This general method is not necessarily limited to either one dimension or delta-function potentials, but, as a check on it, we do apply it to that case and get good agreement with the previous numerical results. As a further exploration of the method, it is applied to square well potentials in one dimension. (Author)

AD-638 829 **Field 20J**
Not available from CFSTI.
Harvard Univ., Cambridge, Mass.
MAGNETIC CHARGE AND QUANTUM FIELD THEORY.
by Julian Schwinger. 22 Nov 65, 9p
Contract AF 49 (638)-1380
Proj. AF-9751
Task 975101
AFOSR-66-1228
Availability: Published in The Physical Review v144 n4 p1087-93 Apr 29 1966.

Descriptors: (*Field theory, *Magnetic fields), Relativity theory, Potential theory.

A quantum field theory of magnetic and electric charge is constructed. It is verified to be relativistically invariant in consequence of the charge quantization condition eg/hc=n, an integer. This is more restrictive than Dirac's condition, which would also allow half-integral values. (Author)

AD-638 953 **Field 20J, 20H**
Not available from CFSTI.
Vienna Univ. (Austria). Dept. of Theoretical Physics.
SYMMETRY GROUP CONTAINING LORENTZ INVARIANCE AND UNITARY SPIN.
by T. Fulton, and J. Wess. 20 Nov 64, 6p
Contract AF 61 (052)-644
Proj. AF-9751
Task 975101
AFOSR-66-0875
Availability: Published in Physics Letters v14 n1 p57-60 Jan 1 1965.

Descriptors: (*Elementary particles, *Groups (Mathematics)), (*Mesons, Groups (Mathematics)), Invariance, Nuclear spins, Selection rules, Austria.

Identifiers: Symmetry (Quantum mechanics).

AD-639 020 **Field 20J**
Not available from CFSTI.
Harvard Univ., Cambridge, Mass. Dept. of Physics.
REPRESENTATION OF THE S MATRIX BY REGGE PARAMETERS.
Revised ed.
by Hung Cheng. 15 Sep 65, 5p
Contract AF 49 (638)-589
Proj. AF-9751
Task 975101
AFOSR-66-1262
Revision of manuscript submitted 5 Mar 1965.
Availability: Published in The Physical Review v144 n4 p1237-9 29 Apr 1966.

Descriptors: (*S matrix, *Momentum), Integral transforms, Elementary particles, Nuclear scattering.

Identifiers: Regge poles.

The S matrix of complex angular momentum and positive energy is expressed by Regge poles, proving that a knowledge of the Regge poles enables one to determine the S matrix uniquely. The background integral in the Mandelstam-Sommerfeld-Watson transform cannot be made to vanish by closing the contour to the left. Furthermore, one cannot express the scattering amplitude by an infinite-series sum of Regge-pole terms where each term is given by the Khuri representation. (Author)

AD-639 182 **Field 20J, 3C, 8E**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
GENERALIZED LORENTZ CONDITIONS FOR A SPHERICALLY SYMMETRIC GRAVITATIONAL FIELD.
by Ya. I. Pugachev. 10 Aug 66, 11p TG-230-T495
Contract NOw-62-0604
TT-66-62289
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n1 p76-80 1964.

Descriptors: (*Gravity, *Relativity theory), Tensor analysis, Algebraic topology, Conformal mapping, USSR.

Generally covariant supplementary conditions (generalized Lorentz conditions) in spherical coordinates, as applied to the Schwarzschild problem, are analyzed. It is found that the limits imposed on the metric in the known Schwarzschild solution correspond to the tensor conditions of Einstein and do not correspond to the generalized harmonic conditions of De Donder-Fock. (Author)

AD-639 259 **Field 20J**
Not available from CFSTI.
National Magnet Lab., Mass. Inst. of Tech., Cambridge.
SPACE-TIME THEORY OF ELEMENTARY PARTICLES. I. BORN RECIPROCITY PRINCIPLE.
by Ernest E. H. Shin. 19 Apr 65, 9p
Contract AF 49 (638)-1468
Proj. AF-9764
AFOSR-66-1483
Availability: Published in Journal of Mathematical Physics v7 n1 p167-73 Jan 1966.

Descriptors: (*Elementary particles, Relativity theory), Groups (Mathematics), Transformations (Mathematics), Nuclear spins, Nuclei, Theory.

Identifiers: Born reciprocity theory, Space-time symmetries, Symmetry (Quantum mechanics).

The use of the Born reciprocity principle as a postulate applied to 'internal' Minkowski space leads to a theory of elementary particles based on a purely 'space-time' point of view. The reciprocity transformations of Born form a discrete subgroup of the x-p rotation group SU (2), which we associate with 'isotopic spin' symmetry. The full dynamic symmetry of the eight-dimensional phase space with Minkowski metric is a 36-parameter group which contains the x-p rotation group SU (2) and the homogeneous Lorentz group as disjoint subgroups. This gives the symmetry of 'subquantic' matter which has oscillator-rotator properties. Some physical aspects of the generators and possible forms of mass formulas for both integer and odd-half integer spins are discussed. Finally, it is suggested that the nonrelativistic counterpart of the present formalism may explain the symmetry of atomic nuclei. (Author)

AD-639 260 **Field 20J**
Not available from CFSTI.
National Magnet Lab., Mass. Inst. of Tech., Cambridge.
SPACE-TIME THEORY OF ELEMENTARY PARTICLES. II. COMPLEX MINKOWSKI SPACE FORMALISM.
by Ernest E. H. Shin. 19 Apr 65, 9p
Contract AF 49 (638)-1468
Proj. AF-9764
AFOSR-66-1482
See also AD-639 259.
Availability: Published in Journal of Mathematical Physics v7 n1 p174-80 Jan 1966.

Descriptors: (*Elementary particles, Relativity theory), Nuclear spins, Groups (Mathematics), Operators (Mathematics), Tensor analysis, Theory.

Identifiers: Minkowski metrics, Soace-time symmetries, Symmetry (Quantum mechanics).

The space-time formalism of elementary particles presented previously (J. Math. Phys. v6 p1307 1965) is generalized to a complex 'internal' Minkowski space described by (z sub mu, w sub mu) and (z sub mu*, w sub mu*). In this way, we are able to accommodate the dual signatures of the 'superselection' operator and the odd-half spins in a natural manner. The full dynamic symmetry group of the 16-dimensional phase space is a 136-parameter group G of which the reciprocity-invariant content is a 64-parameter group isomorphic with the 64-parameter Lie group. The complete L-invariant subgroup of G is a 10-parameter group which is identified as the five-dimensional real 'Lorentz' group and which is the 'unitary spin' subgroup of G. Discussions on the various reduced or subgroup structures of G are given. In particular, the physical nature of the L-invariant generators and possible forms of mass formula are discussed. (Author)

AD-639 309 **Field 20J**
Not available from CFSTI.
Cambridge Univ. (England). Dept. of Applied Mathematics and Theoretical Physics.
THE HIERARCHICAL PRINCIPLE IN PERTURBATION THEORY.
by P. V. Landshoff, D. I. Olive, and J. C. Polkinghorne. 13 Nov 65, 12p

Grant AF-EOAR-79-63
Proj. AF-9751
Task 975101
AFOSR-66-1618
Availability: Published in Nuovo Cimento v43 ser10 p444-53 Mar 1966.

Descriptors: (*Perturbation theory, Analysis), Integrals, Quantum mechanics, Great Britain.

The hierarchical principle is discussed in perturbation theory in the light of the fact that Cutkosky integrals can have lower-order singularities corresponding to contracting out complete closed loops. It is shown that a strict hierarchical principle can be defined for Feynman integrals in the alpha-representation but that due to a hitherto overlooked mechanism identically located singularities occur at different levels in the hierachy. The discussion is illustrated throughout by reference to the ice-cream-cone diagram. (Author)

AD-639 310 **Field 20J, 20H**
Not available from CFSTI.
Cambridge Univ. (England). Dept. of Applied Mathematics and Theoretical Physics.
ON THE COMPLETE UNITARITY EQUATIONS FOR PION-PION SCATTERING.
by Michael M. Broido. 12 Oct 64, 9p
Grant AF-EOAR-79-63
Proj. AF-9751
Task 975101
AFOSR-66-0808
Availability: Published in Journal of Mathematical Physics v6 n11 p1702-8 Nov 1965.

Descriptors: (*Pions, *Nuclear scattering), Equations, Perturbation theory, Algebras, Graphics, Field theory, Great Britain.

Identifiers: Unitarity.

The off-the-mass-shell equations for pion-pion scattering in the lowest approximation of the complete unitarity formalism of Taylor are discussed. It is shown that if the vertex-function renormalization constant is taken to be zero, the equations have no (nonzero) solution. These equations are equivalent to certain bootstrap equations, which thus also have no solution. Both systems are discussed in the case where the renormalization constant is not put equal to zero. (Author)

AD-639 312 **Field 20J**
Not available from CFSTI.
Cambridge Univ. (England). Dept. of Applied Mathematics and Theoretical Physics.
HIGH-ENERGY BEHAVIOUR OF FEYNMAN AMPLITUDES.
by B. Hamprecht. 28 May 65, 20p
Grant AF-EOAR-79-63
Proj. AF-9751
Task 975101
AFOSR-66-0809
Availability: Published in Il Nuovo Cimento v40 serX p542-59 Nov 21 1965.

Descriptors: (*Quantum mechanics, *Integrals), (*Bosons, Integrals), Graphics, Wave functions, Great Britain.

Identifiers: Feynman integrals.

A method that is more general than existing ones is developed for the determination of the coefficient of the leading term in the high-energy expansions of an arbitrary Feynman integral. Some of the discussion is restricted to the case of heavy bosons having a psi cu. interaction, but it can be generalized to cover other types of Feynman integrals as well. (Author)

AD-639 313 **Field 20J, 20H**
Not available from CFSTI.
Clare Coll., Cambridge (England).
THREE PARTICLE SINGULARITIES IN SCATTERING AMPLITUDES.
by David Branson. 1 Jun 65, 24p
Grant AF-EOAR-79-63
Proj. AF-9763
Task 976302
AFOSR-66-1491
Availability: Published in Annals of Physics v35 n3 o351-72 Dec 1965.

Descriptors: (*Elementary particles, *Nuclear scattering), S-matrix, Field theory, Algebraic topology, Electromagnetic waves, Complex variables, Great Britain, Functions.

Identifiers: Scattering amplitude, Singularity.

As a preliminary to a study of the three particle case, a detailed discussion is given, within the framework of the S-matrix postulates of unitarity and analyticity, of methods of defining 'reduced' two particle scattering amplitudes that lack the two particle singularity; the extension to the multichannel case is briefly described. The same methods are used to remove one, two, and three particle physical threshold singularities from a three particle scattering amplitude. Using a causality argument, a derivation is given of the i (epsilon) prescription for all these singularities. (Author)

AD-639 316 **Field 20J, 12A, 20H**
Not available from CFSTI.
Cambridge Univ. (England). Dept. of Applied Mathematics and Theoretical Physics.
FREDHOLM METHOD FOR BETHE-SALPETER EQUATION.
by P. R. Graves-Morris. 8 Dec 65, 3p
Grant AF-EOAR-79-63
AFOSR-66-1774
Availability: Published in Physical Review Letters v16 n5 p201-3 Jan 31 1966.

Descriptors: (*Integral equations, Algorithms), Elementary particles, Equations of motion, Relativity theory, Operators (Mathematics), Great Britain.

Identifiers: Bethe-Salpeter equation, Fredholm method.

The method is essentially one for systematic removal of poles or logarithms in kernels of linear integral equations, when both inhomogeneous term and kernel have the same functional dependence on the parameter variables as distinct from integration variables.

AD-639 318 **Field 20J**
Not available from CFSTI.
Cambridge Univ. (England). Dept. of Applied Mathematics and Theoretical Physics.
MIXING OF REGGE POLES AND CUTS IN A FIELD-THEORY MODEL.
by Arthur R. Swift. 22 Feb 65, 10p
Grant AF-EOAR-79-63
AFOSR-66-0812
Availability: Published in Journal of Mathematical Physics v6 n10 p1472-81 Oct 1965.

Descriptors: (*Field theory, Graphics), (*Elementary particles, Field theory), Quantum mechanics, Nuclear scattering, Iterative methods, Great Britain.

Identifiers: Regge poles.

The Regge poles generated by ladder diagrams in alambda phi cu. theory are mixed with the moving cuts generated by a class of nonplanar graphs containing an internal ladder. Since the contribution from the cut-generating diagram is of order 1/t sq (ln mt), where t is the asymptotic variable, the 1/t sq behavior of the pure ladder graphs is examined and the trajectory of the Regge pole near l = -2 is calculated. The Mellin transform method is used throughout. The transformed amplitude corresponding to a single cut insertion is given by a product of the form pole-cut-pole, where it is only the second Regge trajectory that mixes with the cut. The cut itself depends on the leading trajectory. This result substantiates the predictions as to form of other work based on unitarity, but differs in that the cut and pole depend on different trajectory functions. Finally, multiple insertions of the cut diagrams are shown to generate an amplitude with two moving poles on each sheet of the cut. (Author)

AD-639 452 **Field 20J, 20H**
Not available from CFSTI.
Vienna Univ. (Austria). Institut fuer Theoretisch Physik.
MASS RELATIONS AND THE 'SUPER-LORENTZ GROUP'.
by T. Fulton, and J. Wess. 30 Dec 64, 5p
Contract AF 61 (052)-644
Proj. AF-9751
Task 975101
AFOSR-0877
Availability: Published in Physics Letters v14 n4 p334-6 15 Feb 1965.

Descriptors: (*Elementary particles, *Groups (Mathematics)), Operators (Mathematics), Bosons, Tensor analysis, Mesons, Austria.

Identifiers: Symmetry (Quantum mechanics).

AD-639 453 **Field 20J, 20H**
Not available from CFSTI.
Vienna Univ. (Austria). Institut fuer Theoretische Physik.
ELECTROMAGNETIC FORM FACTORS AND THE GENERALIZED POINCARE GROUP.
by T. Fulton, and J. Wess. 22 Feb 65, 5p
Contract AF 61 (052)-644
Proj. AF-9751
Task 975101
AFOSR-66-0876
Availability: Published in Physics Letters v15 n2 p177-9 15 Mar 1965.

Descriptors: (*Elementary particles, Groups (Mathematics)), Operators (Mathematics), Momentum, Velocity, Charged particles, Austria.

Identifiers: Form factors, Symmetry (Quantum mechanics).

AD-639 535 **Field 20J, 20H**
Not available from CFSTI.
Trinity Coll., Dublin (Eire). School of Mathematics.
THE GENERALIZED KEMMER EQUATION.
by L. Castell. 21 May 65, 5p
Grant AF-EOAR-61-64
Proj. AF-9767
Task 976701
AFOSR-66-1572
Availability: Published in Il Nuovo Cimento v39 Ser10 p344-6 Sep 1965.

Descriptors: (*Elementary particles, Equations), (*Field theory, Equations), Nuclear spins, Nuclear energy levels, Particle trajectories, Momentum, Algebras, Eire.

Identifiers: Kemmer equations.

The extension of the ordinary field theoretical concept of an elementary particle to a 'relativistic rotator', which possesses a certain moment of inertia, leads to a new type of first-order relativistic field equations. One of their important features is the fact that one can calculate nontrivial energy level trajectories for arbitrary high spin. Consideration is given to the 5-dimensional Kemmer equation to which different angular momentum states are intrinsically coupled. The resulting energy level trajectories are compared with a simple classical model. (Author)

AD-639 543 **Field 20J, 20H**
Not available from CFSTI.
Torino Univ. (Italy). Istituto di Fisica.
ON SU3 VECTOR COUPLING COEFFICIENTS.
by G. Ponzano. 10 Sep 65, 19p
Grant AF-EOAR-39-64

Proj. AF-9751
Task 975101
AFOSR-66-1722
Availability: Published in Nuovo Cimento Ser10 v41 p142-58 Jan 1966.

Descriptors: (*Elementary particles, Vector analysis), Groups (Mathematics), Wave functions, Algebras, Matrix algebra, Italy.

Identifiers: Coupling coefficients, Symmetry (Quantum mechanics).

Algebraic techniques are used to calculate several particular SU3 coupling coefficients. Two equivalent expressions for the general nonorthonormalized isoscalar factor are discussed. (Author)

AD-639 544 **Field 20J, 20H**
Not available from CFSTI.
Torino Univ. (Italy). Istituto di Fisica.
ON THE GENERALIZATION OF THE OKUBO IDENTITY FOR SUn.
by F. Gliozzi. 28 Sep 64, 4p
Grant AF-EOAR-39-64
Proj. AF-9751
Task 975101
AFOSR-66-1724
Availability: Published in Il Nuovo Cimento v34 Ser10 p1813-5 Dec 1964.

Descriptors: (*Elementary particles, Groups (Mathematics)), Equations, Operators (Mathematics), Tensor analysis, Bosons, Polynomials, Italy.

Identifiers: Identity elements, Symmetry (Quantum mechanics).

It has been proved (J. Math. Phys. v4 p501 1963) that the Gell-Mann-Okubo mass formula is a direct consequence of the Okubo identity. The aim of this paper is to show how to explicitly construct the analogous identities for any SUn group.

AD-639 545 **Field 20J, 20H**
Not available from CFSTI.
Torino Univ. (Italy). Istituto di Fisica.
A DISPERSION THEORY OF SYMMETRY BREAKING.
by S. Fubini, G. Furlan, and C. Rossetti. 15 Jul 65, 24p
Grant AF-EOAR-39-64
Proj. AF-9751
Task 975101
AFOSR-66-1726
Prepared in cooperation with Trieste Univ., (Italy), and CERN, Geneva.
Availability: Published in Il Nuovo Cimento v40 Ser-10 p1171-93 Cec 1965.

Descriptors: (*Elementary particles, Groups (Mathematics)), Relativity theory, Vector analysis, Nuclear spins, Parity, Operators (Mathematics), Italy.

Identifiers: Symmetry (Quantum mechanics).

A new relativistic approach to the problem of broken symmetries is proposed. This is the covariant generalization of the nonrelativistic sum rules obtained in previous investigations. The result is in the form of dispersion sum rules where the pole term represents the group-theoretical answer and the cut the breaking correction. The method is applied to SU3 and chiral SU3 x SU3 leading to very satisfactory results and predictions. (Author)

AD-639 546 **Field 20J, 20H**
Not available from CFSTI.
Torino Univ. (Italy). Istituto di Fisica.
THE PROJECTIVE GROUP AS A REALIZATION OF THE SU (N, 1) GROUP.
by A. Giovannini, and F. Gliozzi. 5 Jul 65, 7p
Grant AF-EOAR-39-64
Proj. AF-9751
Task 975101
AFOSR-66-1721
Availability: Published in Il Nuovo Cimento v40 Ser-10 p881-6 Dec 1965.

Descriptors: (*Elementary particles, Groups (Mathematics)), Harmonic generators, Transformations (Mathematics), Operators (Mathematics), Italy.

Identifiers: Symmetry (Quantum mechanics).

The dynamical group of the N-dimensional harmonic oscillator is a realization in term of creation and destruction operators of the projective group of linear fractional tranformations. A suitable contraction on this group yields the group SUn as the degeneracy group of the system. (Author)

AD-639 547 **Field 20J, 20H**
Not available from CFSTI.
Torino Univ. (Italy). Istituto di Fisica.
ANALYTICITY IN THE ANGULAR MOMENTUM FOR SINGULAR POTENTIALS.
by M. Giffon, and E. Predazzi. 27 Mar 64, 18p
Grant AF-EOAR-39-64
Proj. AF-9751
Task 975101
AFOSR-66-1718
Prepared in cooperation with Lyon Univ. (France).
Availability: Published in Il Nuovo Cimento v33 Ser-10 p1374-90 Sep 1964.

Descriptors: (*Elementary particles, *Potential theory), Momentum, Special functions (Mathematical), S-matrix, Wave functions, Italy.

The analytic properties in the angular momentum variable of the Jost functions and of the partial-wave S-matrix elements are investigated for a large class of repulsive potentials behaving near the origin as arbitrary inverse powers of the radial variable dominating over the centrifugal term. The asymptotic behaviour of the Jost function for large angular momenta is obtained by means of a W.K.B. analysis and the implications of the asymptotic distribution of poles in the lambda plane on the possibility of writing a Mandelstam representation are also briefly discussed. (Author)

AD-639 549 **Field 20J, 20H**
Not available from CFSTI.
Torino Univ. (Italy). Istituto di Fisica.
DIFFERENTIAL PROPERTIES OF FEYNMAN AMPLITUDES.
by V. deAlfaro, B. Jaksic, and T. Regge. 1964, 12p
Grant AF-EOAR-39-64
Proj. AF-9751
Task 975101
AFOSR-66-1723
Prepared in cooperation with Inst. for Advanced Study, Princeton, N. J.
Availability: Published in High-Energy Physics and Elementary Particles, International Atomic Energy Agency, Vienna Austria Pt3 p263-72 1965.

Descriptors: (*Elementary particles, Topology), Integrals, Graphics, Groups (Mathematics), Differential equations, Matrix algebra, Italy.

Identifiers: Feynman integrals.

A new approach to the study of the analytical properties of Feynman amplitudes is described. The differential properties of each term in the relativistic expansion of scattering amplitudes are investigated. Differential properties means the existence of ordinary differential equations for each variable appearing in the term, such equations being a suitable substitute for the integral representation when coupled with simple boundary conditions. (Author)

AD-639 550 **Field 20J, 20H**
Not available from CFSTI.
Torino Univ. (Italy). Istituto di Fisica.
THEORY OF CORRECTIONS TO UNITARY SYMMETRY FORMULAE.
by G. Furlan, F. Lannoy, C. Rossetti, and G.Segre. 15 Jul 65, 34p
Grant AF-EOAR-39-64
Proj. AF-9751
Task 975101
AFOSR-66-1725
Prepared in cooperation with Trieste Univ. (Italy).
Availability: Published in Il Nuovo Cimento v40 Ser10 p497-629 Nov 1965.

Descriptors: (*Elementary particles, Groups (Mathematics)), Operators (Mathematics), Algebras, Matrix algebra, Momentum, Relativity theory, Moments, Mesons, Baryons, Italy.

Identifiers: Space-time symmetry, Symmetry (Quantum mechanics).

A systematic analysis of the equal-time commutation relations of the generators of an algebra with certain physical operators is made. A method is then introduced whereby considering matrix elements of such commutators between physical one-particle states and using completeness and invariance under space-time translations, corrections to broken-symmetry group-theoretical formulae are obtained. Several applications to weak, electomagnetic and strong interactions are then made. (Author)

AD-639 571 **Field 20J, 20H**
Not available from CFSTI.
Brussels Univ. (Belgium).
GRAVITATIONAL WARD IDENTITY AND THE PRINCIPLE OF EQUIVALENCE.
by R. Brout, and F. Englert. 26 Feb 65, 4p
Grant AF-EOAR-51-63
Proj. AF-9767
Task 976701
AFOSR-1585
Availability: Published in The Physical Review v141 n4 p1231-2 Jan 1966.

Descriptors: (*Identities, *Gravity), Relativity theory, Field theory, Tensor analysis, Elementary particles, Mass-energy relation, Belgium.

Identifiers: Equivalence principle.

The Ward identity is given for a gravitational field interacting with a scalar field. It is shown that in the limit in which the scalar field is taken on the mass shell, this identity becomes the principle of equivalence. (Author)

N66-23945 **Field 20J**
CFSTI Prices HC$1.10 MF$0.50
Oslo Univ., Blindern (Norway).
ELECTRONIC STRUCTURE AND ENERGY LEVELS OF MANY ELECTRON ATOMS FINAL SCIENTIFIC REPORT.
by J. Midtdal. 25 Jan 66, 8p AFOSR-66-0362, AD-628922
Contract AF-EOAR-64-32

Descriptors: *Abstract, Atom, Electronic, Energy, *Energy level, Function, Level, Mechanics, Nuclear, Orbital, Perturbation, Quantum, *Quantum mechanics, Rotation, Scattering, Spin, Structure, Theory, Wave.

For abstract, see S 04 13.

N66-23983 **Field 20J**
CFSTI Prices HC$1.60 MF$0.50
Uppsala Univ. (Sweden).
THE GROUND-STATE THREE-BODY CORRELATION FUNCTION IN A DILUTE BOSON GAS WITH HARD-SPHERE INTERACTION SCIENTIFIC REPORT NO. 41.
by V. H. Smith Jr. 15 Apr 65, 11p ARL-66-0034, AD-629091
Contract AF 61/052/-701
Its Preprint No. 147

Descriptors: Approximation, Body, *Boson, Correlation, *Correlation function, Energy, *Energy level, Excitation, Function, Gas, Ground, Interaction, Level, Nuclear, Physics, Reaction, Sphere, State, Statistical, Three, Wave.

For abstract, see S 04 13.

N66-25016 **Field 20J**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APPLICATION OF UNITARY TRANSFORMATIONS TO FOURTH ORDER PERTURBATION THEORY.
by J. L. Cortez. May 66, 65p NASA-TN-D-3441

Descriptors: Calculation, Correction, *Energy, Formula, Integration, Mechanics, Nondegenerative, Numerical, Perturbation, *Perturbation theory, Quantum, *Quantum mechanics, Stationary, System, Theory.

For abstract, see S 04 13.

N66-25292 **Field 20J**
CFSTI Prices HC$2.00 MF$0.50
Laboratoire De Physique Theorique Et Des Hautes Energies, Orsay (France).
THE SOLUTION OF A STARK EFFECT MODEL AS A DYNAMICAL GROUP CALCULATION.
by G. Flamand. Feb 66, 26p TH/134

Descriptors: Annihilation, Elementary, *Elementary particle, Hydrogen, *Mathematical model, Mathematics, Mechanics, Meson, Mixing, Model, Orbital, Particle, Proton, Quantum, *Quantum mechanics, Rotation, Scattering, *Schroedinger equation, Solution, *Stark effect, State.

For abstract, see S 04 13.

N66-25790 **Field 20J**
CFSTI Prices HC$2.00 MF$0.50
Istituto Superiore Di Sanita, Rome (Italy).
A STATISTICAL ANALYSIS OF THE LIMIT ON THE BREAKDOWN OF QUANTUM ELECTRODYNAMICS ATTAINABLE WITH ELECTRON-POSITRON COLLIDING BEAM MACHINES.
Studio Statistico Dei Limiti Che Possono Essere Posti Da Esperienze Iniziate Da Fasci Collidenti Di Elettroni E Positoni Sulla Validita Della Elettrodinamica Quantica
by U. Amaldi Jr, R. Biancastelli, and P. Stein. 15 Jan 66, 36p ISS-66/1

Descriptors: Analysis, Beam, Breakdown, Collision, Computer, Electrodynamics, Electron, *Electron beam, Error, Ibm 7040 computer, Limit, Machine, *Positron, Quantum, *Quantum electrodynamics, Simulation, Statistical, *Statistical analysis.

For abstract, see S 04 14.

N66-26428 **Field 20J**
CFSTI Prices HC$1.60 MF$0.50
Wisconsin Univ., Madison.
ON THE FEYNMAN INTEGRAL IN DYNAMICS.
by A. M. Arthurs. Jan 66, 14p NASA-CR-75269, MRC-618
Grant NSG-275-62, Contract DA-11-022-ORD-2059

Descriptors: Classical, *Dynamics, Feynman diagram, Function, *Hamiltonian, Mechanics, Motion, Operator, Quantum, *Quantum mechanics, Schroedinger equation, Unified, Wave.

For abstract, see S 04 14.

N66-26432 **Field 20J**
CFSTI Prices HC$2.00 MF$0.50
Wisconsin Univ., Madison.
ON ITERATIVE SOLUTIONS FOR QUANTUM-MECHANICAL BOUND STATES.
by P. D. Robinson. Jan 66, 34p NASA-CR-75270, MRC-609
Grant NSG-275-62, Contract DA-11-022-ORD-2059

Descriptors: Equation, Green function, Integral, Iteration, *Iterative solution, Mechanics, Momentum, Perturbation, Quantum, *Quantum mechanics, *Schroedinger equation, Solution, Space.

For abstract, see S 04 14.

N66-35187 **Field 20J**
CFSTI Prices HC$1.00 MF$0.50
Centro Brasileiro De Pesquisas Fisicas, Rio De Janeiro.
ON THE INTERACTION OF THE GRAVITATIONAL AND SPINOR FIELDS.
by C. G. Oliveiro, and A. Vidal. 1965, 19p
Sponsored In Part By C.I.a.f. Its Notas De Fisica Vol. 12, No. 2

Descriptors: Field, Function, Gravitational, *Gravitational field, *Hamiltonian, Interaction, Particle, Spin, Spinor, Tetrad theory, Transformation, *Vector, Wave.

For abstract, see S 04 20.

N66-35307 **Field 20J**
CFSTI Prices HC$2.00 MF$0.50
Wisconsin Univ., Madison.
APPLICABILITY OF PERTURBATION THEORY TO MOLECULAR PROBLEMS.
by J. O. Hirschfelder. 11 Nov 65, 32p NASA-CR-68474, WIS-TCI-135
Grant NSG-275-62
Presented At The Advanced Seminar On Perturbation Theory And Its Appl. In Quantum Mech., Sponsored By Univ. Of Wis. Math. Res. Center And By Theoret. Chem. Inst., Madison, Wis., 4-6 Oct. 1965 Submitted For Publication

Descriptors: Convergence, Determination, Eigenfunction, Energy, External, Field, Function, Independence, Mechanics, Molecular, *Molecular theory, Perturbation, *Perturbation theory, Property, Quantum, *Quantum mechanics, Theory, Time, Wave.

For abstract, see S 04 20.

AD-638 863 **See Field 7D**

AD-639 311 **See Field 7D**

AD-639 542 **See Field 20H**

20K. SOLID MECHANICS

AD-478 481 **Field 20K, 11F**
CFSTI Prices: HC$4.00 MF$0.75
Columbia Univ., New York. Inst. for the Study of Fatigue and Reliability.
EXPERIMENTAL APPROACH TO BASIC STUDY OF FATIGUE.
by W. A. Wood. Aug 65, 124p Technical rept. TR-24
Contract Nonr-266 (91)
Proj. NR-064-470

Descriptors: (*Fatigue (Mechanics), Metals), Scientific research, Reviews, Test methods, Metallography, Metallic crystals, X-ray diffraction analysis, Crystal lattice defects, Deformation, Strain (Mechanics), Stresses, Crystal structure, Creep, Defects (Materials), Grain boundaries, Bibliographies, Fracture (Mechanics), Ductility, Single crystals, Grain structures (Metallurgy), Temperature.

The report suggests a specific program of experimental work that might usefully be followed in study of the basic mechanism of fatigue and for evaluating the fatigue potentialities of any given metal. It also reviews present knowledge of the fatigue mechanism. Concentrating on recent researches but at the same time referring to older work in order to present a rounded account. (Author)

AD-638 873 **Field 20K**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
THE USE OF A HIGH FREQUENCY FILM CAMERA TO STUDY PLASTIC DEFORMATION OF METALS AT EXPLOSIVE BURDENS.
by A. Schweighofer. 28 Jun 66, 9p FTD-HT-66-43
TT-66-62225
Unedited rough draft trans. of Jemna Mechanika a Optika (Czechoslovakia), n3 p75-6 1965.

Descriptors: (*Metals, Creep), (*Creep, High-speed photography), Explosions, Cameras, Illumination, Czechoslovakia.

A method is described of using the Czech high frequency film camera for the purpose of registering the process of explosive deformation of metals. The main attention is devoted to the method of illuminating the filmed action and synchronization of the formin process with the effectiveness of the high frequency chamber. (Author)

AD-638 883 **Field 20K**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
ABOUT A CERTAIN PROBLEM OF THE OSCILLATIONS OF AN ORTHOTROPIC PLATE PLACED IN A HIGH-TEMPERATURE FIELD.
by S. A. Ambartsumyan. 13 Jun 66, 13p FTD-TT-65-1931
TT-66-62233
Unedited rough draft trans. of Akademiya Nauk SSR. Izvestiya. Mekhanika i Mashinostroenie n4 p133-7 1963.

Descriptors: (*Flat plate models, Oscillation), Elasticity, Thermodynamics, High-temperature research, USSR.

AD-638 909 **Field 20K**
Not available from CFSTI.
Grumman Aircraft Engineering Corp., Bethpage, N. Y. Research Dept.
EFFECT OF EMBEDDING MEDIUM VISCOELASTICITY ON THE TRANSIENT RESPONSE TO PLANE WAVES OF ARBITRARILY THICK CIRCULAR CYLINDERS.
Research rept.
by Jacques Crouzet-Pascal, Hyman Garnet, and Allan Pifko. Aug 66, 44p RE-265J
Contract AF 29 (601)-5993
Availability: Published in The Journal of Applied Mechanics, 42p.

Descriptors: (*Cylindrical bodies, Mechanical waves), (*Viscoelasticity, Embedding substances), Thickness, Rings, Stresses.

The transient response of a circular cylinder of arbitrary thickness, embedded in a viscoelastic medium and impinged upon by plane waves, is obtained. Dilatational and shear incident waves are considered. The solution is valid within the scope of the three dimensional linear theories of elasticity and viscoelasticity. The method of solution, which circumvents the difficulties encountered in a customary transform approaches, relies upon (1) the construction of a train of incident pulses from steady state components, where each pulse represents the time history of the transient stress in the incident wave, and (2) the existence of a physical mechanism that, between pulses, restores the disturbed particles of the cylinder and the surrounding medium to an unstrained state of rest. The influence on the major stress and displacement response of variations in the viscoelastic

properties of the medium is investigated for the case of incident step waves. (Author)

AD-638 994 Field 20K
CFSTI Prices: HC$2.00 MF$0.50
Westinghouse Research Labs., Pittsburgh, Pa.
DETERMINATION OF STRESSES AT NON-RADIAL OPENINGS IN SPHERICAL PRESSURE VESSELS.
by M. M. Leven. Mar 66, 35p Rept. no. 66-9D7-520-R1
Contract NObs-90132
Proj. SF013-06
Task 4218

Descriptors: (*Pressure vessels, *Stresses), Spheres, Experimental data, Model tests.

An attempt was made to simulate experimentally the theoretical case of an oblique hole in a pressurized spherical vessel. For the case of an opening of diameter ratio 0.129 and at 45 degrees to the radial direction, seven different closure schemes were tried. These are listed as WS-16B1, WS-16B1 A to F, inclusive. Radically different stresses were obtained for each closure scheme, indicating a very sensitive dependence of stress on closure conditions. For 0 degree section (i.e., the section in which the acute angle between the opening and the vessel is at the inner surface) the maximum stress varied from 2.55S to 4.81S, S being the nominal stress in the spherical vessel. For the 180 degree section, the maximum stress variation was from 3.06 to 6.75S. (Author)

AD-639 015 Field 20K
Not available from CFSTI.
Princeton Univ., N. J. Dept. of Aerospace and Mechanical Sciences.
THE EXPERIMENTAL TECHNIQUE FOR OBSERVING THE TEMPERATURES DUE TO THE COUPLED THERMOELASTIC EFFECT.
by T. R. Tauchert, and O. W. Dillon Jr. 13 Aug 65, 14p
Contract AF 49 (638)-1306
Proj. AF-9782
Task 978201
AFOSR-66-1753
Prepared in cooperation with Kentucky Univ., Lexington. Dept. of Engineering Mechanics.
Availability: Published in International Journal of Solids Structures v2 p385-91 1966.

Descriptors: (*Aluminum, Elasticity), (*Cantilever beams, Elasticity), (*Wire, Elasticity), (*Thermodynamics, Elasticity), Deformation, Measurement, Surface temperatures, Vibration.

Identifiers: Thermoelasticity.

A system is described which permits routine and easy measurement of the small temperature changes which occur when a material (metal) is deformed in the linearly elastic range. The temperature change produced by a 30-lb/sq. in. increase in stress in aluminum can be measured. Data are reported for long thin wires and cantilever beams made of aluminum. There is generally excellent agreement with the predictions of linear thermoelasticity which is regarded as demonstrating the accuracy of the method. After 11 cycles of free vibration, the cantilever beam surface temperature leads the strain in time. There is also conduction to the neutral axis region in the case of the beam. (Author)

AD-639 158 Field 20K, 20F
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
POLARIZATION-OPTICAL METHOD OF INVESTIGATING STRESSES AND DEFORMATIONS.
by P. I. Polukhin, V. Yu. Markovskii, and M. P. Shaskalskaya. 28 Jun 66, 5p FTD-TT-65-1933
Unedited rough draft trans. of Patent (USSR) 162 685, appl. 836006/26-10, 9 May 63.

Descriptors: (*Stresses, Optical analysis), (*Deformation, Optical analysis), Polarization, Reflection, Metal coatings, Silver, Patents, USSR.

The object of the invention is a polarization-optical method of investigating stresses and deformations. For the purpose of simultaneously investigating the elastic and the plastic stresses and deformations. The surface of the specimen intended for investigation is covered by a layer of pure metal on which afterwards one applies a layer of material for studying the deformations and the observations are made in reflected light. (Author)

AD-639 181 Field 20K
CFSTI Prices: HC$2.00 MF$0.50
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
TORSIONAL FREQUENCIES OF UNIFORM SHAFTS WITH ELASTIC RESTRAINTS AND ELASTICALLY ATTACHED MASSES.
Techanical memo.
by N. Rubinstein, V. G. Sigillito, and J. T. Stadter. Jun 66, 51p TG-833
Contract NOw-62-0604-c

Descriptors: (*Shafts, Torsion), (*Torsion, Vibration), Elasticity, Numerical analysis.

Numerical upper and lower bounds are given to eigenvalues of torsional vibration of the following uniform structures: free shaft elastically restrained at a point; fixed shaft elastically restrained at a point; free shaft with masses elastically attached at points; fixed shaft with a mass elastically attached over an interval. Upper bounds were obtained using the well-known Rayleigh-Ritz procedure, lower bonds were obtained using methods developed by Bazley and Fox. (Author)

AD-639 187 Field 20K
CFSTI Prices: HC$1.00 MF$0.50
Engineering Mechanics Research Lab., Univ. of Texas, Austin.
STUDIES OF PLASTIC WAVE PROPAGATION.
Final rept.
by E. A. Ripperger, and H. L. Plass Jr. Aug 66, 17p EMRL-TR-1007
Grant DA-ARO (D)-31-124-G189
Projs. DA-009925001, ARO (D)-2998-E
AROD-2998.6

Descriptors: (*Mechanical waves, Propagation), Plasticity, Loading (Mechanics), Impact tests, Strain (Mechanics), Stresses, Rods, Creep, Velocity, Torsion.

The object was to find ways and means, experimental and analytical, of surmounting difficulties encountered in the analysis of longitudinal plastic wave propagation and, in the process, gaining a clearer understanding of the mechanics of plastic wave propagation in rods and bars. The greatest stumbling block in the path of further progress in plastic wave studies appears to be the lack of a constitutive relationship obtained without the necessity of prior assumptions regarding the nature of plastic wave propagation. The major effort in this investigation was devoted to the development of experimental techniques for providing data pertinent to the flow condition. These techniques, when developed, were used to obtain data from which a constitutive relationship was developed. (Author)

AD-639 208 Field 20K
CFSTI Prices: HC$3.00 MF$0.75
Courant Inst. of Mathematical Sciences, New York Univ., N. Y.
A NON-LINEAR SHELL THEORY COMPARED WITH THE CLASSICAL THREE DIMENSIONAL THEORY OF ELASTICITY.
by Chester B. Sensenig. Aug 66, 91p IMM-349
Contract Nonr-285 (46), Grant NSF-GP-3465
Proj. NR-041-019
Supported in part by Grant NsG-412.

Descriptors: (*Elasticity, Theory), (*Structural shells, Theory), Nonlinear systems, Mechanical properties.

AD-639 213 Field 20K, 19D
CFSTI Prices: HC$2.00 MF$0.50
Drexel Inst. of Tech., Philadelphia, Pa.
LATE-STAGE EQUIVALENCE IN ONE-DIMENSIONAL IMPACTS.
by Pei Chi Chou, and Bruce P. Burns. Jul 66, 28p
Rept. no. 125-8
Contract DA-18-001-AMC-876 (X)

Descriptors: (*Impact shock, *Numerical analysis), Aluminum, Copper, Gases, Equations of state, One-dimensional flow, Attenuation.

The attenuation of a strong plane shock produced in a target by the impact of a thin striker is studied by the numerical method of characteristics. The calculated results show that late-stage equivalence exists for impacts in aluminum, copper, and ideal gases with various ratios of specific heats, gamma. The shock fronts produced by different impacts approach each other in position, and in strength, at late times provided that du sub o alpha is constant where d is the thickness of the striker, u sub o the impact velocity, and alpha a constant with values of 1.28, 1.50, 1.62, 1.50, and 1.32, for aluminum, copper, and ideal gases with gamma equal to 2.0, 1.4, and 1.1, respectively. (Author)

AD-639 221 Field 20K, 11I, 12A
CFSTI Prices: HC$3.00 MF$0.75
California Univ., Berkeley. Structural Engineering Lab.
A STUDY OF A MULTIPLE INTEGRAL REPRESENTATION OF THE CONSTITUTIVE EQUATION OF A NONLINEAR VISCOELASTIC SOLID.
Technical rept.
by V. V. Neis, and J. L. Sackman. Jul 66, 94p
Rept. no. 66-9
Contract DA-31-124-ARO (D)-460
Projs. DA-20014501B33G, ARO-4547-E
AROD-4547:13

Descriptors: (*Viscoelasticity, Solids), (*Polyethylene plastics, Viscoelasticity), Creep, Polymers, Integral equations, Functional analysis.

Identifiers: Constitutive equations.

The applicability of a functional polynomial of third degree for the constitutive equation of a nonlinear viscoelastic polymer has been investigated. A method for the determination of the kernel functions appearing in the one-dimensional creep formulation has been discussed. Creep measurements of tension and compression in low density polyethylene under single step, two step, and three step loading histories are described. The analysis of this data has provided a basis for the determination of the creep kernel functions. For the loading range used in the tests, the Volterra-Frechet multiple integral expansion of the constitutive functional of low-density polyethylene has been found to be adequately represented by the three term integral representation. A number of cases of general load histories were investigated. A close comparison between the experimental response to these loading histories and the response predicted by the three term integral representation was obtained. (Author)

AD-639 448 Field 20K, 12A, 13M
CFSTI Prices: HC$4.00 MF$0.75
Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
MATRIX ANALYSIS OF AXISYMMETRIC SHELLS UNDER GENERAL LOADING.
Master's thesis.
by Cecil D. Wallace Jr. May 66, 111p GAM/MC/66B-7

Descriptors: (*Matrix algebra, *Structural shells), (*Mechanical properties, Structural shells), Programming (Computers).

Identifiers: Matrix displacement method, Theses.

This report presents a technique for analyzing axisymmetrical shell structures subjected to a general loading condition, using the Matrix Displacement Method. The structures are idealized by truncated conical shell elements and circular flat plate elements, joined together at nodal circles. Loads represented by a combination of Fourier series are applied to the nodal circles, and the behavior is calculated in terms of the displacements and distortions of these nodal circles. Deflections, stresses, and buckling loads may be determined. Since large deflections are likely to occur in thin shell structures, a correction to linear small deflection theory is introduced by way of a geometric stiffness matrix, which also may be used in stability studies. Temperature variations around the circumference and through the thickness of the shell are considered. A computer program to solve the equations presented is available in FORTRAN IV language for an IBM 7094 computer. The method is a fast, versatile, accurate, and relatively simple way to analyze axisymmetric shells. (Author)

AD-639 483 **Field 20K, 12A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
FUNDAMENTAL EQUATIONS FOR SHELLS WITH NEARLY REGULAR MIDDLE SURFACES.
by Shu-tao Chen. 15 Jun 66, 22p FTD-TT-65-1057
TT-66-62323
Edited trans. of Li Hsueh Hsueh Pao (Chinese People's Republic) v7 n3 p196-210 1964.

Descriptors: (*Structural shells, *Tensor analysis), Surface area, Mechanical properties, Perturbation theory, China.

AD-639 486 **Field 20K, 13M**
CFSTI Prices: HC$2.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
STRESS STATE OF A ROTATING CONICAL SHELL WITH A THICK WALL WHICH CHANGES LINEARLY.
by A. D. Kovalenko. 23 Feb 66, 35p FTD-TT-65-1460
TT-66-62348
Unedited rough draft trans. of Akademiya Nauk SSSR. Institut Mekhaniki. Inzhenernyi Sbornik, v9 p143-66 1951.

Descriptors: (*Structural shells, *Stresses), Conical bodies, Thickness, Rotation, Walls, USSR, Structural properties.

The stress state of a conical shell rotating relative to its axes and the thickness of its wall decreases from a peak linearly, and the angle between the generatrix and the axis close to a straight line is discussed. Such a shell finds application in the wheels of turbo compressors, etc. The study was carried out, according to the moment theory, on symmetrically loaded thin shells of rotation. However, the shift from the system of two equations to one differential equation of the second order, suggested in this work, differs from the corresponding shift of Meysner; the latter attained not the proper selection of the fundamental variables, but the use of the general properties of hypergeometric equations. With the aid of the relationships between hypergeometric functions the calculation of these particular solutions were completed. The intensification of the convergence of infinite series entering into the solutions and the decrease of the number of series needed to be summed were attained simultaneously. The expressions for the solutions were compiled in simple form, containing coefficients which depend on the relative meridional coordinate and geometric parameter - the criterion of a similar stress state of a conical shell with a linear change of thickness. This made the tabulation of the coefficients easier. (Author)

AD-639 497 **Field 20K**
Not available from CFSTI.
Missouri Univ., Columbia. Engineering Experiment Station.
A STATISTICAL DEFINITION OF PERFECT MIXTURES OF SOLIDS OF DIFFERENT SIZES.
by Kun Sup Hyun, and L. E. Marc de Chazal. 23 Jul 62, 10p Reprint-79
Availability: Published in I/EC PROCESS DESIGN AND DEVELOPMENT v5 n2 p105-10 Apr 1966.

Descriptors: (*Mixtures, Solids), (*Mathematical models, Mixtures), Particle size, Volume, Analysis of variance, Statistical functions.

When mixing solids, it is desirable to be able to evaluate the performance of a mixer in terms of its ability to produce mixtures that approach the theoretical limit of uniformity. Although a satisfactory correlation exists for mixtures where the particles are of uniform size, none has yet been developed for multisized particles. A mathematical definition of a perfect mixture of three sizes of particles is proposed. The principles employed can be extended to any number of sizes, but the complexity of the equations increases rapidly. Agreement with experimental results appears substantially better than that obtained by previous investigators. (Author)

AD-639 501 **Field 20K**
CFSTI Prices: HC$2.00 MF$0.50
Lehigh Univ., Bethlehem, Pa. Dept. of Applied Mechanics.
GEOMETRIC DISCONTINUITIES IN ELASTOSTATICS.
Technical rept.
by M. K. Kassir, and G. C. Sih. Jun 66, 32p TR-3
Contract Nonr-610 (06)
Proj. NR-064-476

Descriptors: (*Elasticity, *Statics), Potential theory, Boundary value problems, Geometry.

Three-dimensional elastostatic problems for an infinite solid with geometric discontinuities are formulated and solved with the aid of potential functions. In the problem of a linearly varying pressure specified over a plane region bounded by an ellipse, use is made of the gravitational potential at an exterior point of a homogeneous elliptical disk. The problem of prescribing displacements on the surfaces of discontinuity is governed by the Newtonian potential of a simple layer distributed over a disk in the shape of the region of discontinuity. The mass density of the disk is proportional to the prescribed normal displacement. For an 'elliptically shaped' region, the application of the symmetrical form of ellipsoidal coordinate leads to an integral equation of the Abel type for the potential function. It is shown that if the displacements normal to the elliptical plane are given by a polynomial in the variables x2 and y2, then the corresponding normal stress acting over the ellipse is also a polynomial. The results given in this report are useful in the prediction of the stability behavior of elastic solids containing geometric discontinuities. (Author)

AD-639 553 **Field 20K**
CFSTI Prices: HC$2.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
SOME DIRECT METHODS IN THE NONLINEAR THEORY OF SHALLOW SHELLS.
by I. I. Vorovich. 13 Jun 66, 38p FTD-TT-65-1744
TT-66-62357
Edited trans. of Prikladnaya Matematika i Mekhanika (USSR) v20 p449-74 1956.

Descriptors: (*Structural shells, Structural properties), Nonlinear systems, Deformation, Green's function, USSR.

AD-639 556 **Field 20K**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
SMALL NATURAL OSCILLATIONS OF TRIPLE-LAYER SHELLS OF ROTATION.
by V. G. Suvernev. 7 Jun 66, 10p FTD-TT-65-1874
TT-66-62362
Unedited rough draft trans. of Akademiya Nauk SSSR. Sibirskoe Otdelenie. Izvestiya, n10 Seriya Tekhnicheskikh Nauk, n2 p93-8 1964.

Descriptors: (*Structural shells, Oscillation), Rotation, Cylindrical bodies, Elastic shells, Spheres, USSR.

The natural oscillations are investigated of hollow elastic triple-layer shells of rotation with nonsymmetrical by thickness structure. The inertia is considered only in the transverse direction. The filler is considered rigid and transversal-isotropic, carrying layers- isotropic, the material- different, shell-freely supported. In the role of partial cases, oscillations of cylindrical and spherical shells are discussed. (Author)

AD-639 597 **Field 20K, 13H**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
WITH RESPECT TO THE NATURE OF PLASTIC DEFORMATION AT SUPERSONIC VELOCITY ON DEFORMATION.
by Khr. Korteński, and Iv. Bchvarov. 7 Jun 66, 11p FTD-TT-65-1877
TT-66-62366
Unedited rough draft trans. of Mashinostroenie (USSR) n12 p29-32 1964.

Descriptors: (*Metals, *Deformation), USSR, Alloys, Velocity, Explosive forming, Microstructure, Mechanical working.

N66-24390 **Field 20K**
CFSTI Prices HC$1.45 MF$0.75
Washington Univ., Seattle.
PHOTOVISCOELASTICITY.
by E. H. Dill, and C. Fowlkes. May 66, 120p
NASA-CR-444
Grant NSG-401

Descriptors: Analysis, *Birefringence, Extension, Manufacturing, Material, *Mathematical model, Mathematics, Mechanical, Model, Optical, Photomechanics, *Photoviscoelasticity, Property, Stress, *Stress analysis, Transparency, Viscoelasticity.

For abstract, see S 04 13.

N66-24392 **Field 20K**
CFSTI Prices HC$2.00 MF$0.50
Astro Research Corp., Santa Barbara, Calif.
A SEMI-ATOMISTIC MODEL FOR FLAW-INDUCED FRACTURE IN NON-DUCTILE MATERIALS.
by H. Schuerch. May 66, 33p NASA-CR-471
Contract NASW-652

Descriptors: Analysis, Atom, Composite, *Composite material, Concentration, Ductility, Dynamic, Failure, Fiber, *Fracture, Material, *Mathematical model, Mathematics, Matrix, Model, Static, Stress, *Stress concentration.

For abstract, see S 04 13.

N66-24491 **Field 20K**
CFSTI Prices HC$3.00 MF$0.50
Hayes International Corp., Birmingham, Ala.

INVESTIGATION OF LATERAL ACCELERATION-BENDING COUPLING FOR A LARGE BOOSTER UTILIZING MULTI ACCELEROMETERS.
by J. E. Bailey, M. Frimer, and S. R. Mc waters.
22 Dec 65, 56p NASA-CR-74551
Contract NAS8-20201
Its Eng. Rept.-1213

Descriptors: Acceleration, *Accelerometer, Analysis, Bending, *Booster, *Coupling, Domain, Flexible, Frequency, Large, Lateral, Loop, Multiple, Nyquist frequency, Position, Sensor, Stability, *System stability.

For abstract, see S 04 13.

N66-24512 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
A NOTE ON BOUNDARY-CONDITION SIMULATION IN THE DYNAMIC TESTING OF SPACECRAFT STRUCTURES.
by W. H. Gayman. 15 Apr 66, 22p NASA-CR-74655, JPL-TR-32-938
Contract NAS7-100

Descriptors: Bending, Boundary, Condition, Excitation, Exit, Frequency, Interface, Phase, Shear, *Simulation, Simulator, Sine, Spacecraft, *Spacecraft structure, Sweep, Test, Vibration, *Vibration simulator.

For abstract, see S 04 13.

N66-24592 **Field 20K**
CFSTI Prices HC$2.00 MF$0.50
Northwestern Univ., Evanston, Ill.
ENERGY CONSIDERATIONS IN THE ANALYSIS OF STABILITY OF NON-CONSERVATIVE STRUCTURAL SYSTEMS.
by G. Herrmann, and S. Nemat-nasser. Dec 65, 28p NASA-CR-74624
Grant NSG-605
Its Tech. Rept.-65-5

Descriptors: Analysis, Circulatory, Damping, Destabilization, Discrete, *Energy, *Force, Gyroscope, Linear, *Linear system, Nonconservative, Stability, Structural, *Structural stability, System.

For abstract, see S 04 13.

N66-24909 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
ELASTIC CONSTANTS AND THERMAL EXPANSION OF CERTAIN BODIES WITH A NONHOMOGENEOUS REGULAR STRUCTURE.
Uprugiye Postoyannyye I Teplovoye Rasshireniye Nekotorykh Tel S Neodnorodnoy Regulyarnoy Strukturoy
by G. A. Van fo fy. Mar 66, 11p NASA-TT-F-10048
Transl. Into English From Dokl. Akad. Nauk Sssr (Moscow), V. 166, No. 4, 1966 P 817-820

Descriptors: Coefficient, Constant, Crystal, *Crystal structure, Cylinder, Elastic, *Elastic constant, Expansion, Mathematics, Method, Molecular, *Molecular structure, Nonhomogeneity, Regular, State, Stress, Structure, Theory, Thermal, *Thermal expansion coefficient.

For abstract, see S 04 13.

N66-24933 **Field 20K**
CFSTI Prices HC$3.00 MF$0.75
Michigan Univ., Ann Arbor.
SIMPLE APPROXIMATIONS FOR FORCE-DEFLECTION CHARACTERISTICS OF AIRCRAFT TIRES.
by S. K. Clark. May 66, 71p NASA-CR-439
Grant NSG-344

Descriptors: Aircraft, *Aircraft tire, Approximation, *Approximation method, Characteristics, *Deflection, Design, Inflation, *Loading, Method, Pressure, Side, Size, Tire, Vertical, Vibration.

For abstract, see S 04 13.

N66-24960 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
Texas A&M Univ., College Station.
THE ANALYSIS OF STRUCTURALLY ORTHOTROPIC SHELLS BY MEANS OF THE COMPLIANCE METHOD.
by T. J. Kozik. 1 May 66, 15p NASA-CR-74737
Contract NGR-44-001-031

Descriptors: *Anisotropic shell, Compliance, Constant, Deformation, Elastic, *Elastic constant, Equation, Filament, Isotropic, Load, Matrix, Method, *Orthotropic shell, Plate, Rib, Sandwich, Stiffness, Strength, Stress, Thin.

For abstract, see S 04 13.

N66-24983 **Field 20K**
CFSTI Prices HC$3.00 MF$0.75
Allied Research Associates, Inc., Concord, Mass.
MINIMUM WEIGHT DESIGN OF SYMMETRICALLY STIFFENED ORTHOTROPIC CYLINDERS UNDER AXIAL COMPRESSION.
by G. Gerard, and C. Lakshmikantham. 30 Mar 66, 69p NASA-CR-74667
Contract NASW-1174
Its Tech. Rept.-292-2

Descriptors: Axial, *Axial compression, Compression, Cylinder, Design, Minimum, *Orthotropic cylinder, Orthotropism, *Stiff structure, Stiffness, Structural, *Structural design, Structure, Symmetry, Weight.

For abstract, see S 04 13.

N66-25023 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
ON THE STATE OF STRESS NEAR CURVILINEAR HOLES IN SHELLS.
O Napryazhennom Sostoyanii Okolo Krivolineynykh Otverstiy V Obolochkakh
by A. N. Guz, and G. N. Savin. May 66, 16p NASA-TT-F-423
Transl. Into English From Izv. Akad. Nauk Sssr, Otd. Tekhn. Nauk- Mekhan. I Mashinostr. (Moscow), V. 7, No. 6, 1964 P 96-105

Descriptors: Boundary, *Boundary value problem, Concentration, Curvilinear, Cylinder, *Cylindrical shell, Hole, Problem, Spherical, *Spherical shell, Stress, *Stress concentration, U.s.s.r., Value.

For abstract, see S 04 13.

N66-25024 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
THE STRESSED STATE NEAR CURVILINEAR REINFORCED ORIFICES IN SHELLS.
O Napryazhennom Sostovanii Okolo Krivolineynykh Podkreplennykh Otverstiv V Obolochkakh
by A. N. Guz, and G. N. Savin. May 66, 11p NASA-TT-F-424
Transl. Into English From Inzh. Zh. (Ussr), V. 5, No. 1, 1965 P 103-109

Descriptors: Curvilinear, Eccentricity, Elastic, Ellipse, Fiber, Internal, *Internal pressure, Loading, *Orifice, Pressure, Reinforcement, *Reinforcing fiber, Shell, Spherical, *Spherical shell, *Stress, Uniform.

For abstract, see S 04 13.

N66-26120 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
Minnesota Univ., Minneapolis.
THEORETICAL CONSIDERATION OF THE INFLUENCE OF REFORMING PROCESSES ON THE FRACTURE STRENGTH OF SOLIDS TECHNICAL REPORT NO. 105.
by C. C. Hsiao, S. R. Moghe, and H. H. Von schmeling. Mar 66, 18p NASA-CR-75083
Contract NGR-24-005-070

Descriptors: Analysis, Behavior, Break, Consideration, Dependence, Differential, *Differential equation, Equation, Fracture, *Fracture resistance, Macroscopy, Process, Reformation, Resistance, Solid, Strength, Stress, *Stress analysis, Theoretical, Time, Variation.

For abstract, see S 04 14.

N66-26121 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
Minnesota Univ., Minneapolis.
ANISOTROPIC RELAXATION FUNCTIONS AND STRENGTH OF ORIENTED SOLIDS TECHNICAL REPORT NO. 106.
by C. C. Hsiao, and S. R. Moghe. Mar 66, 22p NASA-CR-75082
Contract NGR-24-005-070

Descriptors: Anisotropy, Behavior, *Deformation, Dependence, Elastic, *Elastic strength, Fracture, *Fracture resistance, Function, Mathematics, Mechanical, *Mechanical property, Microscope, Model, Orientation, Property, *Relaxation, Resistance, Solid, Strain, Strength, Time, Viscoelasticity.

For abstract, see S 04 14.

N66-26690 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
Minnesota Univ., Minneapolis.
THEORY OF TIME DEPENDENT MECHANICAL BREAKDOWN OF ORIENTED MEDIA TECHNICAL REPORT NO. 104.
by C. C. Hsiao, H. H. Kausch von schmeling, and S. R. Moghe. Mar 66, 16p NASA-CR-75084
Contract NGR-24-005-070

Descriptors: Break, Breakdown, Dependence, Forming, Fracture, Kinetic, Mechanical, Molecular, *Molecular structure, Orientation, Phase, Solid, *Solid phase, Strength, Stress, Structure, Tensile, *Tensile stress, Time, *Time dependency.

For abstract, see S 04 14.

N66-26695 **Field 20K**
CFSTI Prices HC$2.00 MF$0.50
Massachusetts Inst. Of Tech., Cambridge.
COMPUTER-AIDED ELECTRONIC CIRCUIT DESIGN, PART I. CONDUCTION PROCESSES IN THIN FILMS, PART II STATUS REPORT, 1 JUN. - 30 NOV. 1965.
Dec 65, 39p NASA-CR-75033, ESL-SR-256
Grant NSG-496

Descriptors: *Circuit, Computer, *Computer program, *Conduction, Design, Digital, Electronic, Element, Film, Input, Network, Nonlinear, Output, Process, Program, Simulation, Solution, Thin, *Thin film.

For abstract, see S 04 14.

N66-26702 **Field 20K**
CFSTI Prices HC$2.00 MF$0.50
Midwest Applied Science Corp., Lafayette, Ind.
THE DEVELOPMENT OF COMPUTATIONAL TECHNIQUES FOR THE IDENTIFICATION OF LINEAR AND NONLINEAR MECHANICAL SYSTEMS SUBJECT TO RANDOM EXCITATION FIRST QUARTERLY REPORT.

by W. Gersch. Mar 66, 41p NASA-CR-75068
Contract NAS5-10106

Descriptors: Coefficient, *Computation, Damping, *Differential equation, Excitation, Function, Impedance, Linear, *Linear system, Mechanics, Nonlinear, *Nonlinear system, Quasi-linear, Random, Response, Structure, System, Transfer.

For abstract, see S 04 14.

N66-26704 **Field 20K**
CFSTI Prices HC$7.00 MF$1.75
North American Aviation, Inc., Downey, Calif.
ANALYSIS OF WEBS OF PARTIAL-TENSION-FIELD BEAMS SUBJECTED TO LATERAL PRESSURE LOADINGS.
by T. Furuike, L. Kovalevsky, L. A. Nelson, and F. L. Rish. Apr 66, 303p NASA-CR-75054, SID-66-135
Contract NAS8-20113

Descriptors: Analysis, Beam, Buckling, Compression, *Compression loading, Diagonal, Field, Flange, Lateral, Load, Loading, Partial, Pressure, Stress, *Stress and load, Structural analysis, Structure, Tension, Upright, Vertical, *Web.

For abstract, see S 04 14.

N66-26875 **Field 20K**
CFSTI Prices HC$3.00 MF$0.50
Aerojet-general Nucleonics, San Ramon, Calif.
METEOROID IMPACT SIMULATION BY MAGNETIC GRADIENT PARTICLE ACCELERATION TECHNIQUES FINAL TECHNICAL REPORT, 1 JUL. 1964 - 15 APR. 1966.
by R. L. Chapman. May 66, 56p NASA-CR-75284, AN-1490
Contract NAS8-11174

Descriptors: *Accelerator, Diffusion, Feasibility, Field, *Gradient, *Impact, Magnetic, *Magnetic field, Metal, *Micrometeoroid, Photography, Projectile, Simulation, Vaporization.

For abstract, see S 04 14.

N66-34207 **Field 20K**
CFSTI Prices HC$3.25 MF$1.25
Lockheed Missiles And Space Co., Sunnyvale, Calif.
INVESTIGATION OF JUNCTURE STRESS FIELDS IN MULTICELLULAR SHELL STRUCTURES.
by F. A. Brogan, J. M. Massard, P. Stern, C. E. Stuhlman, and E. Y. Tsui. Apr 64, 173p NASA-CR-61050
Contract NAS8-11079

Descriptors: Algebra, Cone, Cylinder, Elastic, *Elastic shell, Field, Inertial, *Loading, Numerical, Plate, Pressure, Shell, Solution, Sphere, *Stress, Thermal, Thin, *Thin walled shell, Wall.

For abstract, see S 04 20.

N66-34407 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
A POWER-SPECTRAL-DENSITY COMPUTER PROGRAM FOR THE VIBRATION LABORATORY.
by C. P. Chapman. 1 Aug 66, 25p NASA-CR-77310, JPL-TR-32-993
Contract NAS7-100

Descriptors: Acceleration, Calculation, Computer, *Computer program, Density, *Density distribution, Distribution, Effect, Excitation, *Fortran, Frequency, Noise, Plot, Power, *Power spectrum, Program, Random, Spectrum, Test, Vibration, *Vibration effect.

For abstract, see S 04 20.

N66-34628 **Field 20K**
CFSTI Prices HC$3.00 MF$0.75
California Univ., Berkeley.
EQUATIONS FOR THERMOELASTIC AND VISCOELASTIC CYLINDRICAL SANDWICH SHELLS.
by W. J. Oberndorfer. Mar 66, 80p NASA-CR-77308
Grant NSG-637
Its Rept.-66-1

Descriptors: Construction, Cylinder, Deformation, Equation, Heating, Sandwich, *Sandwich construction, Shell, *Thermoelasticity, *Viscoelastic cylinder, Viscoelasticity.

For abstract, see S 04 20.

N66-34665 **Field 20K**
CFSTI Prices HC$2.00 MF$0.50
General Technology Corp., Elgin, Ill.
LINEAR THEORY OF MICROPOLAR VISCOELASTICITY TECHNICAL REPORT NO. 8-2.
by A. C. Eringen. Jun 66, 35p NASA-CR-77219
Contract NASW-1299

Descriptors: Elastic, Equation, Fluid, Linear, *Linear equation, Polar, *Solids, Strain, Stress, Theory, Thermodynamics, *Viscoelasticity.

For abstract, see S 04 20.

N66-34666 **Field 20K**
CFSTI Prices HC$5.00 MF$1.00
Collins Radio Co., Cedar Rapids, Iowa.
OPTIMIZATION OF VIBRATION TESTING TIME TECHNICAL SUMMARY REPORT, 29 JUN. 1964 - 10 OCT. 1965.
by I. F. Gerks. 15 Jun 66, 159p NASA-CR-77338
Contract NAS8-11278

Descriptors: Alloy, Aluminum, Beam, Cantilever, *Cantilever beam, Damage, Damping, Equation, Equivalent, *Fatigue test, Field, Log, *Palmgren miner rule, Prediction, *Prediction theory, Random, Resonant, Sine, Sweep, Test, Theory, Time, Vibration, *Vibration testing.

For abstract, see S 04 20.

N66-34668 **Field 20K**
CFSTI Prices HC$3.00 MF$0.75
General Technology Corp., Torrance, Calif.
REFLECTION OF PLANE WAVES FROM THE FLAT BOUNDARY OF A MICROPOLAR ELASTIC HALFSPACE.
by A. C. Eringen, and V. R. Parfitt. Jul 66, 65p NASA-CR-77233
Contract NASW-1299
Its Tech. Rept.-8-3

Descriptors: Amplitude, Effect, Elastic, Flat, *Flat surface, Free, Half, *Half-space, *Microstructure, Plane, *Plane wave, Polar, Propagation, Ratio, Reflection, Space, Stress, Surface, Wave, *Wave propagation.

For abstract, see S 04 20.

N66-34681 **Field 20K**
CFSTI Prices HC$4.00 MF$0.75
General American Transportation Corp., Niles, Ill.
SHOCK AND VIBRATION. TRANSPORTATION ENVIRONMENTAL CRITERIA FINAL REPORT.
by F. E. Ostrem, and M. L. Rumerman. 21 Sep 65, 103p NASA-CR-77220, MR-1262
Contract NAS8-11451

Descriptors: Acceleration, Air, Criterion, Design, Environment, Frequency, Impact, Package, Rail, Rocket, *Rocket vehicle, Shock, *Shock spectrum, Spectrum, Speed, *Transportation, Truck, Vehicle, Vibration, *Vibrational spectrum, Water.

For abstract, see S 04 20.

N66-34995 **Field 20K**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration, Langley Research Center, Langley Station, Va.
TRANSONIC FLUTTER INVESTIGATION OF MODELS OF A PROPOSED VARIABLE-SWEEP WING.
by J. R. Gurley Jr, and C. L. Ruhlin. Dec 62, 44p NASA-TM-X-739

Descriptors: Analysis, Flutter, *Flutter analysis, Model, Sweep, *Swept wing, Transonic, *Transonic flutter, Tunnel, Variable, *Variable sweep, Wind, Wing.

For abstract, see S 04 20.

N66-35018 **Field 20K**
CFSTI Prices HC$2.00 MF$0.50
Southwest Research Inst., San Antonio, Tex.
LONGITUDINAL VIBRATION OF RING STIFFENED CYLINDRICAL SHELLS CONTAINING LIQUIDS TECHNICAL REPORT NO. 7.
by H. N. Abramson, and D. D. Kana. 15 Jun 66, 39p NASA-CR-77396
Contract NAS8-11045

Descriptors: Axisymmetry, *Booster, Cylinder, *Cylindrical shell, Longitudinal, Mount, Response, Ring, Shell, Space vehicle, Spring, Tank, Testing, Vibration, *Vibration testing.

For abstract, see S 04 20.

N66-35170 **Field 20K**
CFSTI Prices HC$3.00 MF$0.75
Wyle Labs., Inc., Huntsville, Ala.
RESPONSE OF PANELS TO OSCILLATING SHOCK WAVES.
by M. J. Crocker. Mar 66, 59p NASA-CR-77435, WR-66-17
Contract NAS8-20073-1

Descriptors: Computation, Damping, Data, Experiment, *Loading, Mathematics, Model, *Oscillation, *Panel, Response, Shock, *Shock wave, Structural, *Structural vibration, Vibration, Wave.

For abstract, see S 04 20.

N66-35173 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
Grumman Aircraft Engineering Corp., Bethpage, N. Y.
STUDY ON DETERMINING STABILITY DOMAINS FOR NONLINEAR DYNAMICAL SYSTEMS QUARTERLY PROGRESS REPORT NO. 1, 1 MAY - 1 AUG. 1966.
by G. Geiss. 15 Aug 66, 19p NASA-CR-77429, RM-334
Contract NAS8-20306

Descriptors: *Algorithm, Attraction, Determination, Domain, Dynamic, *Dynamic stability, *Equilibrium, *Liapunov function, Motion, Nonlinear, *Nonlinear system, Numerical, Problem, Solution, Stability, System.

For abstract, see S 04 20.

N66-35225 **Field 20K**
CFSTI Prices HC$3.00 MF$0.75
North American Aviation, Inc., Los Angeles, Calif.
STRUCTURAL ANALYSIS, DESIGN, AND DEVELOPMENT OF AN S-IC SKIN PANEL, 1 JULY - 10 DECEMBER 1965.

by P. A. Boukidis. 10 Dec 65, 97p NASA-CR-77526, NA-65-1004
Contract NAS8-20530

Descriptors: Alloy, Analysis, Bonding, Design, Development, Diffusion, Engineering, Fabrication, Material, Panel, Roll, *Saturn s- ic stage, *Skin, Structural, *Structural engineering, Titanium, *Titanium alloy.

For abstract, see S 04 20.

N66-35227 **Field 20K**
CFSTI Prices HC$1.00 MF$0.50
Illinois Univ., Urbana.
ANNEALING OF FAST NEUTRON DAMAGE IN IMPURITY-CONDUCTING N-TYPE GERMANIUM.
by W. D. Compton, S. W. Depp, and E. L. Wolf. Jul 66, 16p NASA-CR-77483
Grant NSG-228-62

Descriptors: *Annealing, Bombardment, Damage, Defect, Effect, Electric, *Electric property, *Fast neutron, Germanium, N type, *N-type semiconductor, Neutron, Property, Resistivity, Semiconductor, Temperature.

For abstract, see S 04 20.

N66-35312 **Field 20K**
CFSTI Prices HC$2.00 MF$0.50
Southwest Research Inst., San Antonio, Tex.
A RIGOROUS DERIVATION OF SECOND-APPROXIMATION THEORY OF ELASTIC SHELLS TECHNICAL REPORT NO. 5.
by W. C. Hu. 10 Nov 65, 47p NASA-CR-68055
Contract NASR-94/06/
Submitted For Publication

Descriptors: *Approximation method, Derivation, Displacement, Elastic, Equation, Flat, Linear, Load, Method, Motion, Plate, *Second, Shell, *Shell theory, Strain, Stress, Theory, Thin.

For abstract, see S 04 20.

N66-35313 **Field 20K**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
FATIGUE LIFE UNDER VARIOUS RANDOM LOADING SPECTRA.
by S. A. Clevenson, and R. Steiner. 1965, 28p NASA-TM-X-56984
Presented At The 35th Symp. On Shock And Vibration, New Orleans, 25-28 Oct. 1965

Descriptors: Alloy, Aluminum, *Aluminum alloy, Distribution, Dynamics, Failure, Fatigue, *Fatigue life, Life, Load, *Load test, Random, Strain, Strength, Stress, *Stress-strain distribution, Structural, Tensile, Test.

For abstract, see S 04 20.

PB-173 084 **Field 20K, 20L**
CFSTI Prices: HC$5.60 MF$0.50
Illinois Univ., Urbana. Dept. of Theoretical and Applied Mechanics.
STUDENT SYMPOSIUM ON ENGINEERING MECHANICS (6th).
by D. C. Holloway, S. A. Kiger, T. K. Meagher, C. C. Nelson, and R. T. Weiss. Jun 66, 54p TAM-289

Descriptors: (*Mechanics, Solid state physics), (*Engineering, Mechanics), Stresses, Fracture (Mechanics), Photoelasticity, Steel, Symposia, Students.

CONTENTS: A comparison of three experimental techniques for analyzing stress; A study of crack propagation by dynamic photoelasticity; Stress functions for plane linear elasticity with couple stresses; Influence of temperature on crack toughness of mild steel; Effect of strain cycling on a hard steel.

AD-638 705 See Field 22B

AD-638 842 See Field 20D

AD-638 844 See Field 8K

AD-638 921 See Field 11D

AD-638 976 See Field 20H

AD-639 248 See Field 11F

AD-639 337 See Field 20D

AD-639 427 See Field 12A

AD-639 454 See Field 20M

AD-639 474 See Field 8G

AD-639 596 See Field 6E

AD-639 619 See Field 13E

20L. SOLID STATE PHYSICS

AD-638 941 **Field 20L, 7D**
Not available from CFSTI.
Franklin Inst. Research Labs., Philadelphia, Pa. Chemistry Div.
DIFFUSION IN ORGANIC CRYSTALS. II. LATTICE AND SUBGRAIN-BOUNDARY DIFFUSION.
by P. J. Reucroft, H. K. Kevorkian, and M. M. Labes. 21 Feb 66, 5p
AROD-4168:7
Research supported in part by ARPA. See also AD-614 531.
Availability: Published in The Journal of Chemical Physics v44 n12 p4416-20 15 Jun 1966.

Descriptors: (*Single crystals, *Anthracenes), (*Phenanthrenes, *Diffusion), Crystal lattices, Grain boundaries, Impurities, Heat of activation, Anisotropy.

Self-diffusion studies at extended diffusion anneal times and impurity (phenanthrene) diffusion studies in melt-grown anthracene crystals have shown evidence for a fast subgrain-boundary-diffusion process in addition to a much slower lattice diffusion. Subgrain boundary diffusion is faster by a factor of 1,000,000 to 10,000,000 the activation energy being 25% to 66% the value for lattice diffusion. Phenanthrene diffusion is very similar to self-diffusion in terms of diffusivity magnitude and activation energy. Diffusion anisotropy is more marked for phenanthrene diffusion, diffusivity perpendicular to the ac plane being greater than that perpendicular to the ab plane. (Author)

AD-638 942 **Field 20L**
Not available from CFSTI.
California Univ., Los Angeles, Calif. Dept. of Physics.
COUPLING BETWEEN H (-) LOCALIZED MODES AND RARE-EARTH ION ELECTRONIC STATES IN RARE-EARTH TRIFLUORIDES.
by G. D. Jones, and R. A. Satten. 11 Feb 66, 11p
AROD-2099:25
Research supported in part by A.E.C.
Availability: Published in The Physical Review v147 n2 p566-76 15 Jul 1966.

Descriptors: (*Rare earth compounds, *Crystal lattice defects), (*Fluorides, Crystal lattice defects), (*Infrared spectroscopy, Rare earth compounds), Lanthanum compounds, Cerium compounds, Praseodymium compounds, Neodymium compounds, Hydrogen, Deuterium, Absorption spectrum, Atomic energy levels.

Identifiers: Lanthanum trifluoride, Cerous fluoride, Praseodymium fluoride, Neodymium fluoride.

Crystals of LaF3, CeF3, PrF3, and NdF3 doped with hydrogen and deuterium have been studied spectroscopically. Two strong polarized fundamentals and their combinations have been observed in the infrared for both H (-) and D (-). The fundamentals appear also polarized in the vibronic spectrum of doped NdF3 coupled to several electronic transitions. Extra electronic lines appearing only in the doped crystals occur on the long-wavelength side of the usual rare-earth electronic transitions. From frequency differences, these extra levels are the parent states for the local mode vibronic transitions. The displacement of the extra electronic lines from the usual electronic transitions is mainly due to a changed crystalline field and covalency arising from the replacement of F by H, and is greater at higher levels. In addition the extra electronic levels have slightly different frequencies for hydrogenated and deuterated crystals. This isotope shift depends in both magnitude and sign on the particular electronic level and ranges from 0.5/cm (for transitions to 4F3/2) to -2.0/cm (for transitions to 4F7/2). This effect is accounted for by a large difference in zero-point amplitude for H (-) and D (-) localized modes which, through the electron-vibration interaction, perturbs each electronic level to a different extent. (Author)

AD-638 943 **Field 20L, 7D**
Not available from CFSTI.
Stanford Univ., Calif. Dept. of Materials Science.
THE BASIC SIGNIFICANCE OF OXYGEN CHEMISORPTION ON THE PHOTOELECTRONIC PROPERTIES OF CdS AND CdSe.
by Richard H. Bube. 25 Mar 66, 6p
AROD-4119:12
Research supported in part by ARPA.
Availability: Published in Journal of the Electrochemical Society v113 n8 p793-8 Aug 1966.

Descriptors: (*Oxygen, Chemisorption), (*Cadmium compounds, *Photoelectric effect), Sulfides, Selenides, Crystals, Impurities, Atomic energy levels.

Identifiers: Cadmium selenide, Cadmium sulfide, Desorption.

The long-known phenomenon of oxygen chemisorption on CdS and CdSe, more intensively studied recently, is shown to have a basic significance for the photoelectronic properties of thin crystals or layers. It is proposed that every 'pure' crystal of CdS or CdSe is of relatively high conductivity (> or = 0.000001/ (OHM CM)) and high photosensitivity (electron lifetime of 0.001 sec) as prepared by standard techniques. If the crystal or layer is thin enough, oxygen adsorption obscures these properties and gives the appearance of a highly insulating insensitive material. Smaller effects are found in crystals containing deliberately incorporated impurities as long as the Fermi level at room temperature lies above the level associated with the surface state for chemisorbed oxygen. Because of the universal presence of oxygen chemisorption effects, every experiment in which the effect of heat, vacuum, or photo-excitation are investigated toward understanding the nature of photochemical changes, must be interpreted in the light of the significant effects associated with the simple desorption of oxygen. (Author)

AD-639 004 **Field 20L**
Not available from CFSTI.
National Magnet Lab., Mass. Inst. of Tech., Cambridge.
CYCLOTRON RESONANCE IN PYROLYTIC AND SINGLE CRYSTAL GRAPHITE.
Interim rept.
by S. J. Williamson, M. Surma, H. C. Praddaude, R. A. Patten, and J. K. Furdyna. 18 Nov 65, 7p
Contract AF 49 (638)-1468
Proj. AF-9764
AFOSR-66-1560
Availability: Published in Solid State Communications v4 p37-41 1966.

Descriptors: (*Graphite, *Cyclotron resonance phenomena), (*Pyrolytic graphite, Cy-

clotron resonance phenomena), Carriers (Semiconductors), Band theory of solids, Brillouin zones, Magnetic fields, Single crystals.

Cyclotron resonance experiments on pyrolytic and single crystal graphite have yielded a sequence of resonances which can be explained solely on the basis of resonances from majority holes near point K in the Brillouin zone. Due to the interaction between the pi-bands in graphite in the presence of a magnetic field, no resonance is expected or observed from the majority electrons. (Author)

AD-639 006 **Field 20L**
Not available from CFSTI.
National Magnet Lab., Mass. Inst. of Tech., Cambridge.
ELECTRICAL RESISTANCE DUE TO NONMAGNETIC LOCALIZED STATE IN DILUTE ALLOYS.
Revised ed.
by Duk-Joo Kim. 19 Jan 66, 11p
Contract AF 49 (638)-1468
Proj. AF-9764
AFOSR-66-1613
Availability: Published in The Physical Review v146 n2 p455-63 Jun 10 1966.

Descriptors: (*Crystal lattice defects, Resistance (Electrical)), Alloys, Atomic energy levels, Hartree-Fock approximation, Green's function, Moments, Band theory of solids.

The electrical resistance due to a nonmagnetic localized state is examined in order to determine the possibility of observing a resistance minimum even when there is no local moment on an impurity. While Anderson's s-d mixing model is adopted to describe the impurity state in the metal, the treatment goes beyond the simple Hartree-Fock approximation. The lifetime of the conduction electrons at the fermi surface is calculated by means of the double-time Green's function method, and the resulting electrical resistance is shown to have a maximum at a certain temperature. When this temperature is in a favorable region we may observe the resistance maximum as well as the minimum. The occurrence of a local moment is also discussed from our calculation of the lifetime of conduction electrons and it is associated with an instability of the system. A new criterion for the occurrence of a local moment is obtained which appears to be in accord with experiments. (Author)

AD-639 007 **Field 20L**
Not available from CFSTI.
National Magnet Lab., Mass. Inst. of Tech., Cambridge.
QUANTUM OSCILLATIONS IN THE ULTRASONIC ATTENUATION IN CHROMIUM.
by Y. Shapira, W. D. Wallace, N. Tepley, and H. V. Bohm. 11 Jun 65, 3p
Contract AF 49 (638)-1468
Proj. AF-9761
Task 976103
AFOSR-66-1318
Prepared in cooperation with Wayne State Univ., Detroit, Mich. Dept. of Physics, Grant AF-AFOSR-695-64.
Availability: Published in Physics Letters v17 n3 p184-5 Jul 15 1965.

Descriptors: (*Chromium, *Ultrasonic radiation), Oscillation, Single crystals, Magnetic fields, Cryogenics, Attenuation, Quantum mechanics.

Identifiers: DeHaas-VanAlphen effect.

A report is given of preliminary observations of quantum oscillations in the ultrasonic absorption in single crystal samples of chromium which were measured at 1.2K in magnetic fields up to 110 kilogauss.

AD-639 009 **Field 20L**
Not available from CFSTI.
National Magnet Lab., Mass. Inst. of Tech., Cambridge.
INTERBAND MAGNETO-ABSORPTION AND FARADAY ROTATION IN INDIUM ANTIMONIDE.
by C. R. Pidgeon, and R. N. Brown. 24 Jan 66, 11p
Contract AF 49 (638)-1468
Proj. AF-9764
AFOSR-66-1629
Availability: Published in The Physical Review v146 n2 p575-83 Jun 10 1966.

Descriptors: (*Indium alloys, *Antimony alloys), (*Magneto-optic effect, Indium alloys), Semiconductors, Band theory of solids, Cryogenics, Magnetic fields, Selection rules, Solid solutions, Atomic energy levels.

Identifiers: Indium antimonide.

Direct interband magneto-optical transitions were observed in pure n-type InSb at liquid-helium temperature using magnetic fields up to 96.5 kG. The theory of the magnetic levels in the valence and conduction bands at the zone center is carried out using a modification of the method of Luttinger and Kohn. The interaction between conduction and valence bands was treated exactly, and the effect of higher bands to order k sq. Selection reles were evaluated for both allowed and warping induced direct valence-to-conduction-band transitions. Comparison of theoretical with experimental spectra (using circular and plane-polarized light in the Faraday and Voigt configurations, respectively) showed good agreement for the magnetic field in the 110 and 100 crystal directions. (Author)

AD-639 017 **Field 20L, 7E**
Not available from CFSTI.
California Univ., Riverside. Dept. of Chemistry.
GENERATION OF CHARGE CARRIERS IN MOLECULAR CRYSTALS BY DIRECT OPTICAL TRANSITIONS TO THE CONDUCTING STATE.
by James J. Ewing, and David R. Kearns. 29 Nov 65, 2p
Grant DA-ARO (D)-31-124-G511
AROD-4719:3
Availability: Published in The Journal of Chemical Physics v44 n8 p3139-40 15 Apr 1966.

Descriptors: (*Photoconductivity, Organic compounds), (*Organic compounds, *Carriers (Semiconductors)), Single crystals, Electrical conductance, Crystal lattices, Ionization, Helium, Dipole moments, Anthracenes.

Previous theoretical investigations of photoconduction in organic molecular crystals have dealt with indirect carrier generation mechanisms. Results are now reported of a calculation on the generation of carriers by a direct optical transition to the conducting state of the crystal. Consideration is given to the direct photoionization of a hypothetical body centered cubic lattice of helium atoms. (Author)

AD-639 054 **Field 20L, 20B, 7E**
Not available from CFSTI.
National Research Council, Ottawa (Ontario). Div. of Applied Chemistry.
ELECTRON SPIN RESONANCE SPECTRA OF RADIATION - DAMAGED INORGANIC CRYSTALS.
by J. R. Morton. 1965, 28p
NRC-8424
Availability: Published in Effects of High-Energy Radiation on Inorganic Substances, ASTM Special Technical Publication No. 400 p93-119 1966.

Descriptors: (*Crystals, *Radiation damage), (*Crystal lattice defects, *Electron spin resonance), Color centers, Paramagnetic resonance, Inorganic compounds, Alkali metal compounds, Halides, Salts.

Irradiation of inorganic materials frequently causes paramagnetic fragments to be trapped in the crystalline matrix. These fragments (radicals) may be studied by ESR. This technique is described briefly and isoelectronic radicals are compared with each other. The discussion of the diatomic radicals trapped in irradiated alkali-halides is followed by that of the more complex species which may be trapped in irradiated oxy- and fluoro-salts. (Author)

AD-639 064 **Field 20L, 20E**
CFSTI Prices: HC$3.00 MF$0.75
Lincoln Lab., Mass. Inst. of Tech., Lexington.
SOLID STATE RESEARCH 1966-2.
Quarterly technical summary rept. 1 Feb-30 Apr 66.
by Alan L. McWhorter. 1966, 72p
Contract AF 19 (628)-5167
Proj. 649L
ESD-TR-66-207
See also AD-632 998.

Descriptors: (*Solid state physics, Scientific research), (*Semiconductor devices, Scientific research), (*Lasers, Scientific research), Pumping (Optical), Single crystals, Crystal growth, Band theory of solids, Magnetism, Transport properties, Field theory, Intermetallic compounds.

Topics covered are Solid State Device Research, Optical Techniques and Devices, Materials Research, and Physics of Solids.

AD-639 214 **Field 20L**
CFSTI Prices: HC$4.00 MF$0.75
Illinois Univ., Urbana. Dept. of Physics.
LOW TEMPERATURE SPECIFIC HEAT OF Sn AND Sn-In ALLOYS.
Technical rept.
by William Roy Wilkes. Jul 66, 107p
Contract DA-31-124-AROD-359
Proj. DA-20014501B11B
AROD-2771:12

Descriptors: (*Tin, Specific heat), (*Tin alloys, Specific heat), (*Indium alloys, Specific heat), Superconductivity, Low-temperature research, Temperature.

Identifiers: Debye temperature.

The normal state specific heats of pure tin and alloys consisting of 0.5, 1, 2, 4, and 6 atomic percent indium in tin have been measured between about 0.4 and 4.2 K. All of the alloys lie within the solid solubility limit of indium in tin. Measurements were made in an adiabatic calorimeter cooled by a He3 refrigerator, with the specimens magnetically quenched from the superconducting state. Additional cooling of some specimens was possible by adiabatic magnetization to achieve temperatures as low as 0.24 K. The results for pure tin are compared with recent data for the temperature coefficient of the normal electronic specific heat, gamma, and the Debye temperature, theta. The results for the alloys are interpreted in terms f the variation in gamma and theta, and comparisons are made with recent determinations of the variations of gamma and theta with increasing indium concentration. While the variation of theta is in reasonable agreement with reported values, the variation of gamma with increasing indium content is positive, in disagreement with previously reported data. The results are also discussed in the light of the theories of Markowitz and Kadanoff and of Ginsberg on the variation of the critical temperatures of superconductors with alloying.

AD-639 261 **Field 20L, 18B**
Not available from CFSTI.
National Magnet Lab., Mass. Inst. of Tech., Cambridge.
ISOMER-SHIFT MEASUREMENT IN W182.
by S. G. Cohen, N. A. Blum, Y. W. Chow, R. B. Frankel, and L. Grodzins. 6 Dec 65, 4p
Contract AF 49 (638)-1468
AFOSR-66-1616
Contract AT (30-1)-2098.

Availability: Published in Physical Review Letters v16 n8 p322-5 Feb 21 1966.

Descriptors: (*Tungsten, *Mossbauer effect), Nuclear energy levels, Stable isotopes, Tungsten compounds, Chlorides, Ground state, Wave functions.

A report is given on an unambiguous Mossbauer measurement of the isomeric shift of the 2 (+)-0 (+), 100-keV transition in W182, observed between metallic tungsten and WC16. The radius of the 2 (+) rotational state is thus different from that of the 0 (+) ground state. Preliminary results for the isomer shifts in W184 and W186 are also reported.

AD-639 271 **Field 20L, 20H, 20B**
Not available from CFSTI.
New York Univ., N. Y.
INTERVALLEY-SCATTERING SELECTION RULES IN III-V SEMICONDUCTORS.
by Joseph L. Birman, Melvin Lax, and Rodney Loudon. 6 Oct 65, 5p
Grant DA-ARO (D)-31-124-G424
AROD-4054:13
Availability: Published in The Physical Review v145 n2 p620-2 May 13 1966.

Descriptors: (*Selection rules, *Semiconductors), Scattering, Brillouin zones, Zinc compounds, Sulfides, Crystal lattices, Phonons.

Selection rules are presented for intervalley scattering between the lowest conduction-band minima at gamma, X, and L in the Brillouin zone of a III-V semiconductor. These selection rules are required for theories of the Gunn effect. The two most important crystals experimentally are GaAs, where longitudinal optic phonons cause the intervalley scattering, and InP, where longitudinal acoustic phonons produce the scattering. (Author)

AD-639 340 **Field 20L, 11F**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
PERIOD OF IDENTITY AND MICROHARDNESS OF SEMICONDUCTOR SOLID SOLUTIONS OF InP-GaAs.
by N. N. Sirota, and L. A. Makovetskaya. 21 Jun 66, 8p FTD-TT-65-2000
TT-66-62319
Unedited rough draft trans. of Akademiya Navuk BSSR, Minsk. Doklady, v7 n4 p230-2 1963.

Descriptors: (*Semiconductors, Intermetallic compounds), (*Intermetallic compounds, Solid solutions), Hardness, Indium alloys, Phosphorus alloys, Gallium alloys, Arsenic alloys, Phase studies, USSR.

Identifiers: Indium phosphide, Gallium arsenide.

AD-639 395 **Field 20L**
CFSTI Prices: HC$1.00 MF$0.50
Wisconsin Univ., Madison.
CYCLOTRON RESONANCE EXPERIMENTS.
Final scientific rept., 1 Apr 63-31 Mar 66.
by Richard N. Dexter, Paul S. Peercy, Francis F. Huppe, Philip L. Radoff, and Boyd Veal. Apr 66, 19p
Contract AF 33 (657)-11515
Proj. AF-7885
ARL-66-0078

Descriptors: (*Cyclotron resonance phenomena, Semiconductors), (*Semiconductors, Transport properties), (*Metalloids, Transport properties), Tin, Tellurium, Antimony, Indium alloys, Antimony alloys, Cadmium compounds, Sulfides, Mercury compounds, Tellurides, Carriers (Semiconductors), Microwaves, Propagation, Oscillation, Modulation, Band theory of solids.

Identifiers: Cadmium sulfide, de Haas-van Alphen effect, Fermi surfaces, Helicons, Indium antimonide, Mercuric telluride.

Various experiments including cyclotron resonance, helicon propagation and de Haas - van Alphen effect were conducted for purposes of studying transport properties of several semiconductors and semimetals. These materials include Alpha-Sn, Te, InSb, Sb, CdS and HgTe. In most cases it was possible to obtain new information on effective masses, carrier densities or scattering times. Instrumentation which was constructed to permit the use of large uniaxial stress in cyclotron resonance and de Haas - van Alphen experiments is described along with a discussion of the more successful research areas. (Author)

AD-639 469 **Field 20L, 7D, 20C**
Not available from CFSTI.
California Univ., Los Angeles. Dept. of Physics.
CONTRIBUTION TO THE HYPERFINE FIELD FROM CATION-CATION INTERACTIONS.
by Nai Li Huang, R. Orbach, and E. Simanek. 15 Jun 66, 3p
Contract Nonr-233 (88)
Proj. NR-018-420
Availability: Published in Physical Review Letters v17 n3 p134-6 Jul 18 1966.

Descriptors: (*Ions, *Hyperfine structure), (*Atomic orbitals, Hyperfine structure), Spinels, Magnetic materials, Antiferromagnetism, Manganese, Nuclear spins.

Two mechanisms are reported for the change in hyperfine field at the site of a magnetic ion brought about by the presence of neighboring magnetic ions: transfer of a 3d electron from the neighboring ion to the 4s level of ion in question, and orthogonalization of the antibonding orbitals of the surrounding cations to the inner s cores of the magnetic ion. The total s-state admixture from both mechanisms results in an increase in the hyperfine field in a simple cubic antiferromagnet over that found in the dilute salt. (Author)

AD-639 475 **Field 20L**
Not available from CFSTI.
Northwestern Univ., Evanston, Ill. Dept. of Materials Science.
ELECTRICAL CONDUCTIVITY AND THERMOELECTRIC POWER OF NIOBIUM DIOXIDE.
Technical rept.
by R. F. Jannick, and D. H. Whitmore. 19 Jul 65, 6p
Contract Nonr-1228 (16)
Proj. NR-032-459
Availability: Published in Phys. Chem. Solids v27 p1183-7 1966.

Descriptors: (*Semiconductors, Niobium compounds), (*Niobium compounds, Dioxides), Electrical conductance, Thermoelectricity, Temperature, Measurement.

Identifiers: Niobium dioxide.

The electrical conductivity and thermoelectric power of NbO2 have been measured as a function of temperature over the range 196-1273K and as a function of composition within the single-phase region centered about the stoichiometric compound. Isopiestic reduction experiments indicate a homogeneous phase field width of 0.159wt.% oxygen for the NbO2 phase at 1100C, but both the electrical conductivity and thermoelectric power appear to be insensitive to composition in this single-phase region. The electrical conductivity, as well as the thermoelectric power, exhibit an irregular behavior at 1070K indicating the occurrence of either a phase change or an insulator-to-metal transition at this temperature. The present experimental observations of the electrical properties in the niobium-oxygen system are quite similar to those observed in the titanium-oxygen system in which the irregular behavior in the electrical conductivity of Ti2O3 is attributed to a magnetic interaction. (Author)

AD-639 531 **Field 20L**
Not available from CFSTI.
Hebrew Univ., Jerusalem (Israel). Dept. of Physics.
PARAMAGNETIC-RESONANCE SPECTRUM OF CO (1+) IN SINGLE CRYSTALS OF CALCIUM OXIDE.
by W. Low, and J. T. Suss. 24 Aug 65, 6p
Grant AF-EOAR-24-64
Proj. AF-9761
Task 976103
AFOSR-66-1623
Prepared in cooperation with Soreq Research Establishment, Yavne (Israel).
Availability: Published in Physical Review Letters v15 n12 p519-21 20 Sep 1965.

Descriptors: (*Cobalt, *Paramagnetic resonance), Calcium compounds, Oxides, Single crystals, Line spectrum, Crystal lattices, Hyperfine structure, Polarization, Israel.

Identifiers: Calcium oxide.

The paramagnetic-resonance spectrum of Co (1+) in single crystals of CaO is reported. Details of this spectrum are discussed. Effective care polarization for Co (1+) in MgO and CaO and for Ni (2+) in MgO are compared. The core polarization for Co (1+) is found to be nearly independent of the crystal host. (Author)

N66-23926 **Field 20L**
CFSTI Prices HC$4.00 MF$1.00
Stanford Univ., Calif.
TOTAL RESEARCH ACTIVITY RELATED TO THE SCIENCE OF MATERIALS FOURTH ANNUAL TECHNICAL REPORT, JUL. 1, 1964 - JUN. 30, 1965.
1965, 149p NASA-CR-74696, AD-629013
Grants NSG-378, NSG-155

Descriptors: Acoustics, Catalysis, Concrete, Crystal, Kinetics, Magnetic, Material, *Materials science, Mechanics, Metal, Optics, Photoelectricity, Physics, Polymer, Quantum, Reaction, Research, Review, Science, Semiconductor, Solid, *Solid state physics, Spectroscopy, State, Survey.

For abstract, see S 04 13.

N66-24737 **Field 20L**
CFSTI Prices HC$2.60 MF$0.50
Soreq Research Establishment, Israel Atomic Energy Commission, Yavneh.
THE GROUND STATES AND RELATIVE STARK SPLITTINGS OF SOME TRIVALENT RARE EARTH IONS IN THE CUBIC CRYSTAL FIELD OF CALCIUM FLUORIDE.
by U. Ranon. May 64, 26p 1A-897, AFOSR-65-2305
Contract AF-AFOSR-63-64

Descriptors: Calcium, *Calcium compound, Compound, Crystal, Cubic, Earth, Effect, Eigenfunction, Electron, Ground, *Ground state, Ion, Lattice, Rare, *Rare earth, Spin, *Stark effect, State, Trivalent.

For abstract, see S 04 13.

N66-24795 **Field 20L**
CFSTI Prices HC$3.00 MF$0.75
Israel Inst. Of Tech., Haifa.
ELECTRICAL PROPERTIES OF TRANSITION METAL OXIDES UP TO 1800 DEG C INTERIM SCIENTIFIC REPORT NO. 1, 1 AUG. 1964 - 30 SEP. 1965.
by D. S. Tannhauser. 11 Nov 65, 73p AD-628321
Contract AF 61/052/-825

Descriptors: Cobalt, *Cobalt oxide, Conductivity, Electric, *Electric property, Element, Manganese, *Manganese oxide, Metal, *Metal oxide, Oxide, Power, Property, Stoi-

chiometry, Thermoelectric, Transition, *Transition element.

For abstract, see S 04 13.

N66-24956 Field 20L
CFSTI Prices HC$1.00 MF$0.50
Stanford Univ., Calif.
FUNDAMENTAL STUDIES OF THE METALLURGICAL, ELECTRICAL, AND OPTICAL PROPERTIES OF GALLIUM PHOSPHIDE QUARTERLY PROGRESS REPORT, 1 JAN. - 31 MAR. 1966.
1966, 22p NASA-CR-74765
Grant NSG-555

Descriptors: Chemical, *Chemical property, *Cobalt, Concentration, Crystal, Dope, Electric, Gallium, *Gallium phosphide, Growth, Impurity, Metallurgy, Optical, *Optical property, Phosphide, Property, Sample, Single, Temperature, Thermodynamics.

For abstract, see S 04 13.

N66-24959 Field 20L
CFSTI Prices HC$2.00 MF$0.50
Rensselaer Polytechnic Inst., Troy, N. Y.
RADIATION DAMAGE TO SEMICONDUCTORS BY HIGH- ENERGY ELECTRON AND PROTON RADIATION PROGRESS REPORT, 15 SEP. 1965 - 15 MAR. 1966.
by J. C. Corelli. 1966, 33p NASA-CR-74734
Grant NSG-290

Descriptors: Absorption, Axis, Band, Concentration, Damage, Defect, Electron, Germanium, Hazard, Impurity, Infrared, Proton, *Proton irradiation, Radiation, *Radiation hazard, *Semiconductor, Silicon, Spectroscopy, Vacancy, Wavelength.

For abstract, see S 04 13.

N66-25000 Field 20L
CFSTI Prices HC$2.00 MF$0.50
North Carolina State Coll., Raleigh.
THEORETICAL AND EXPERIMENTAL STUDIES OF RADIATION-INDUCED DAMAGE TO SEMICONDUCTOR SURFACES AND THE EFFECTS OF THIS DAMAGE ON SEMICONDUCTOR DEVICE PERFORMANCE SEMIANNUAL PROGRESS REPORT NO. 4, 1 SEP. 1965 - 28 FEB. 1966.
1966, 44p NASA-CR-74733, SDL-4-588-1
Grant NSG-588

Descriptors: *Capacitor, Center, Damage, Deep, Device, Experiment, Gamma, *Germanium, Irradiation, Metal, *Metal oxide semiconductor (mos), Mos, Oxide, Performance, Potential, Radiation, *Recombination, Semiconductor, *Semiconductor device, Silicon, Surface, Velocity.

For abstract, see S 04 13.

N66-25373 Field 20L
CFSTI Prices HC$3.00 MF$0.75
Harshaw Chemical Co., Cleveland, Ohio.
DEVELOPMENT OF OPTICAL COATINGS FOR CD S THIN FILM SOLAR CELLS FINAL REPORT.
by E. R. Hill, and J. C. Schaefer. Dec 65, 63p NASA-CR-54965
Contract NAS3-6464

Descriptors: Cadmium, *Cadmium sulfide, Calcium, Carbonate, Cell, *Coating, Corundum, Deposition, Emission, Film, Fluoride, Infrared, *Infrared radiation, Magnesium, Optical, Oxide, Radiation, *Radiation emission, Silicon, Solar, Solar cell, Sulfide, Thin, *Thin film.

For abstract, see S 04 13.

N66-26259 Field 20L
CFSTI Prices HC$1.00 MF$0.50
West Virginia Univ., Morgantown.
THE PARAMAGNETIC SUSCEPTIBILITY OF LITHIUM AND SODIUM METAL FINAL REPORT.
by W. E. Vehse. 1963, 19p NASA-CR-74966
Grant NSG-533

Descriptors: Anomaly, Conduction, *Conduction electron, Electron, Knight, Low temperature, Magnetic, Metal, Nuclear, *Paramagnetism, Resonance, Shift, *Sodium, Spectrometer, Spin, *Spin resonance, Susceptibility.

For abstract, see S 04 14.

N66-26650 Field 20L
CFSTI Prices HC$1.00 MF$0.50
Hawaii Univ., Honolulu.
ON VACUUM UV STUDY OF SOLIDS STATUS REPORT NO. 7, NOV. 1 - APR. 30, 1966.
by W. Dong, and K. Watanabe. 1966, 8p NASA-CR-75109
Grant NSG-328

Descriptors: Aluminum, Bromide, Cuprous, Density, Electron, *Electron emission, Emission, Film, Halide, *Luminescence, Nitric, Optical, Oxide, Phase, *Photoconductivity, Photoionization, Potassium, Quantum, Radiation, Solid, *Solid phase, Tellurium, Thin, Ultraviolet, *Ultraviolet radiation, Vacuum, Yield.

For abstract, see S 04 14.

N66-34630 Field 20L
CFSTI Prices HC$4.00 MF$0.75
Michigan Univ., Ann Arbor.
STUDY OF LITHIUM MOBILITY IN IRRADIATED SILICON.
by W. A. Hackler, and C. Kikuchi. Jul 66, 106p NASA-CR-77303
Grant NSG-115-61
Its Rept.-04381-8-t

Descriptors: Bombardment, Boron, Coefficient, Defect, Diffusion, *Diffusion coefficient, Effect, *Electron, Fast, *Fast neutron, Ion, Irradiation, *Lithium, Mobility, Neutron, Semiconductor, *Silicon.

For abstract, see S 04 20.

N66-34631 Field 20L
CFSTI Prices HC$3.00 MF$0.75
Martin Co., Baltimore, Md.
STUDY OF ELECTRON-PHONON INTERACTIONS IN III-V SEMICONDUCTORS FINAL SUMMARY REPORT, JAN. 15, 1965 - MAY 31, 1966.
by J. Martin. Jun 66, 75p NASA-CR-77302
Contract NAS8-20012

Descriptors: Acoustic, *Acoustic generator, Antimony, Crystal, Damping, Dislocation, Electron, *Electron-phonon interaction, Generator, Indium, Interaction, Microwave, Phonon, Piezoelectricity, Quartz, *Semiconductor, Solid, Technique, Tourmaline, *Transducer, Wave.

For abstract, see S 04 20.

N66-35107 Field 20L, 20H
CFSTI Prices HC$1.00 MF$0.50
Rio Grande Do Sul Univ., Porto Alegre (Brazil).
APPLICATION OF GAMMA-GAMMA ANGULAR CORRELATION TO THE STUDY OF INTERACTIONS BETWEEN NUCLEI AND THE ENVIRONMENT IN WHICH THEY ARE EMBEDDED FINAL REPORT, MAY 1965 - MAY 1966.
by F. C, Zawislak. May 66, 15p REPT.-4, AD-635306
Contract DA-ARO-49-092-65-G72

Descriptors: Angular, *Angular correlation, Correlation, Electric, Field, Gamma, Internal, Nuclear, *Nuclear spectroscopy, Radiation, Solid, Spectrometer, Spectroscopy.

For abstract, see S 04 20.

N66-35236 Field 20L
CFSTI Prices HC$3.00 MF$0.75
Colorado Univ., Boulder.
THE ABSOLUTE QUANTUM EFFICIENCY OF CALCIUM TUNGSTATE WITH LEAD IN THE EXTREME ULTRAVIOLET REGION SCIENTIFIC REPORT NO. 1, 1 FEB. 1965 - 30 JUN. 1966.
by V. N. Saxena. 1966, 76p NASA-CR-77508
Contract NGR-06-003-034

Descriptors: Absorption, Calcium, *Calcium tungstate, Efficiency, Far, *Far ultraviolet, Intensity, *Lead alloy, *Luminescence, Phosphor, Phosphorescence, Photon, Quantum, Scattering, Tungstate, Ultraviolet.

For abstract, see S 04 20.

N66-35241 Field 20L
CFSTI Prices HC$3.00 MF$0.75
Naval Ordnance Test Station, China Lake, Calif.
THEORETICAL AND EXPERIMENTAL INVESTIGATIONS OF THE PHYSICS OF CRYSTALLINE SURFACES SECOND QUARTERLY STATUS REPORT, 1 MAY - 31 JUL. 1966.
by E. Bauer. Jul 66, 69p NASA-CR-77475
NASA ORDER R-05-030-001

Descriptors: Alkali, Alkali halide, Annealing, Contamination, Crystal, *Crystal structure, Crystalline, Deposition, Effect, Electron, *Electron scattering, Emission, Film, Function, Halide, Metal, *Metal film, *Relativistic effect, Relativity, Scattering, *Single crystal, Structure, Temperature, Work, *Work function.

For abstract, see S 04 20.

AD-638 767 See Field 7D

AD-638 914 See Field 9A

AD-639 002 See Field 20C

AD-639 222 See Field 21I

AD-639 223 See Field 17E

AD-639 433 See Field 9A

AD-639 504 See Field 20C

AD-639 568 See Field 9A

AD-639 570 See Field 5A

N66-24425 See Field 20I

PB-173 084 See Field 20K

20M. THERMODYNAMICS

AD-638 906 Field 20M
CFSTI Prices: HC$1.00 MF$0.50
Boeing Scientific Research Labs., Seattle, Wash. Geo-Astro Physics Lab.
TRANSIENT TEMPERATURES OF ARRAYS OF PLATES AND CUBES RADIATING IN A VACUUM.
by D. F. Winter. Jul 66, 23p D1-82-0547

Descriptors: (*Heat transfer, Partial differential equations), Vacuum, Space environmental conditions, Surface properties, Rectangular bodies, Numerical methods and procedures, Temperature, Solids, Thermal radiation.

When certain conditions are satisfied, the temperature history of an evacuated particulate medium

is determined primarily by radiative exchange between surfaces of solid material. This paper presents a discussion of transient radiative heat exchange in two simple types of evacuated discontinuous media with gray surfaces: (1) a semi-infinite array of thin parallel plates and (2) a plane-bounded semi-infinite array of small cubes, contiguous at their vertices. The equations which describe heat transfer within these arrays are presented, together with numerical results. Calculations for special cases are compared with solutions of the heat conduction equation with a 'radiant conductivity' and an appropriate radiative boundary condition. Models such as those discussed may be useful in describing transient radiative heat exchange at the surface of the Moon. (Author)

AD-639 092 **Field 20M**
CFSTI Prices: HC$2.00 MF$0.50
Massachusetts Inst. of Tech., Cambridge. Dept. of Metallurgy.
COOLING RATES IN SPLAT COOLING.
Technical rept.
by Robert C. Ruhl. 1 Sep 66, 32p TR-12
Contract Nonr-1841 (38)
Proj. DSR-7618

Descriptors: (*Cooling, Liquid metals), (*Thermal conductivity, Cooling), Liquids, Quenching (Cooling), Experimental data.

Identifiers: Splat cooling.

Calculations and experimental observations made on cooling rates during splat quenching are presented. Three possible types of cooling behavior are discussed: ideal cooling, intermediate cooling, and Newtonian cooling. The effects of splatting-process variables on the cooling rates are described, the most important of these variables being splat thickness and the quality of the thermal contact between the splat and substrate. Splat-cooling rates range typically from 10,000 to above 10 to the 10th power C/sec., depending on the actual conditions. (Author)

AD-639 161 **Field 20M, 20A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
INTENSIFICATION EFFECT OF ULTRASONIC WAVES ON THE HEAT TRANSFER PROCESS BETWEEN LIQUIDS OUTSIDE AND INSIDE THE TUBES.
by Hwa-ting Cheng. 31 May 66, 14p FTD-TT-65-1766
TT-66-62287
Edited trans. of Wu Li Hsueh Pao (Chinese People's Republic) v20 n4 p368-73 1964.

Descriptors: (*Ultrasonic radiation, *Heat transfer), Liquids, Pipes, China, Thermal conductivity, Water, Lubricants.

Conclusions: (1) The heat transfer process can be intensified by the use of ultrasonic bivration. The experimental results showed that the average rate of increase of the coefficient of thermal conductivity between hot and cold was 80%. That between water and lubricating oil remained at 20%. (2) The result of the effect of ultrasonic wave was far from the maximum limiting value. Following the experimental results and theoretical discussions, it can be predicted that a still larger intensification effect may be obtained. An equation is given which suggests the main avenue of approach towards that goal. (Author)

AD-639 183 **Field 20M**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
AN APPROXIMATE METHOD OF CALCULATING A THERMALLY INSULATED LAYER WITH ACCOUNT TAKEN OF RADIATION.
by G. A. Matuzok. 29 Jul 66, 13p TG-230-T493
Contract NOw-62-0604
TT-66-62290
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Aviatsionnaya Tekhnika (USSR), v7 n3 p117-23 1964.

Descriptors: (*Thermal insulation, *Thermal radiation), Approximation (Mathematics), Polynomials, USSR.

The problem of calculating the heat field of the plate of a plate-insulator system radiating heat to the ambient medium is solved. Assuming that the thermal characteristics of the material are constant and the temperature gradient over the thickness is zero, the problem reduces to the solution of a one-dimensional equation of heat conduction with initial T = T sub zero and tau = zero. Veinik's approximate method is discussed, where the virtual temperature distribution over the thickness is approximated by a polynomial to find solutions for problems that cannot be solved by using exact methods. The heating process is divided into two stages: the first stage, where the change in temperature field spreads over the entire thickness of the insulator, and the second stage, where heating takes place simultaneously over the entire plate thickness. (Author)

AD-639 184 **Field 20M**
CFSTI Prices: HC$1.00 MF$0.50
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
SOLUTION OF A MIXED STEADY-STATE HEAT-CONDUCTION PROBLEM FOR A CYLINDER.
by R. A. Pavlovskii. 28 Jul 66, 8p TG-230-T492
Contract NOw-62-0604-c
TT-66-62291
Trans. of Inzhenerno-Fizicheskii Zhurnal (USSR), v7 n11 p73-6 1964.

Descriptors: (*Cylindrical bodies, *Thermal conductivity), Heat transfer, Surfaces, Boundary value problems, Conformal mapping, Integral equations, USSR.

A solution is given to the steady-state heat-conduction problem with mixed boundary conditions for the surface of an infinitely long cylinder. The solution is obtained by conformal mapping in combination with the method of dual integral equations. (Author)

AD-639 454 **Field 20M, 20K**
Not available from CFSTI.
Technische Hochschule, Vienna (Austria).
ORTLICH UND ZEITLICH ZUFALLIG VERTEILTE TEMPERATUR-UND SPANNUNGSFELDER (Space and Time Dependent Random Temperature and Stress Fields).
by J. L. Zeman. 16 Sep 64, 20p
Contract AF 61 (052)-645
Proj. AF-9749
Task 974901
AFOSR-66-0201
Text in German.
Availability: Published in Acta Mech v1 n2 p194-211 1965.

Descriptors: (*Thermal stresses, Mathematical analysis), (*Temperature, Determination), Solids, Functions, Integral transforms, Austria.

The problem of determining--in the sense of correlation theory--the properties of temperature and stress in the interior of a body to which a random quantity of heat is supplied is, under certain assumptions, reduced to the problem of finding deterministic influence functions. The results are illustrated by examples. (Author)

N66-24106 **Field 20M**
CFSTI Prices HC$5.00 MF$1.00
Macneal-schwendler Corp., San Marino, Calif.
ANALYSIS OF THERMAL TEST ERRORS RESULTING FROM IMPERFECTLY COLLIMATED SOLAR SIMULATION BEAMS FINAL TECHNICAL REPORT.
by J. J. Brooks, and E. J. Gooze. 21 Mar 66, 154p NASA-CR-71776
Contracts NAS7-100, JPL-951330
Prepared For Jpl

Descriptors: Analysis, Beam, Chamber, Collimator, Equation, Light, Numerical, *Numerical analysis, Optical, *Optical property, Property, Simulator, Solar, *Solar simulator, Source, Spacecraft, Thermal, *Thermal simulation.

For abstract, see S 04 13.

N66-24387 **Field 20M**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL INVESTIGATION OF MEGANATT DIRECT- CURRENT ARC HEATING OF NITROGEN.
by D. R. Boldman, and J. P. Campbell. May 66, 41p NASA-TN-D-3423

Descriptors: Arc, *Arc heating, Current, Direct, Electricity, Evaluation, Four, Gas, *Gas stream, Heat, Heater, High energy, Hypersonic, *Hypersonic heat transfer, *Nitrogen, Stream, Thermodynamics, Transfer, Tunnel.

For abstract, see S 04 13.

N66-24586 **Field 20M**
CFSTI Prices HC$5.00 MF$1.25
Motorola, Inc., Phoenix, Ariz.
THERMAL RESISTANCE MEASUREMENT TECHNIQUES STUDY PROGRAM FINAL REPORT.
by K. W. Davidson, and P. H. Greer. 11 Feb 66, 197p NASA-CR-71745
Contracts NAS7-100, JPL-K-382143
Prepared For Jpl

Descriptors: Accuracy, Development, Device, Heat, *Heat resistance, Measurement, Repeater, Resistance, *Resistance device, Silicon, Technique, Thermal, *Transistor.

For abstract, see S 04 13.

N66-24593 **Field 20M**
CFSTI Prices HC$3.00 MF$0.75
Massachusetts Inst. Of Tech., Cambridge.
THERMAL CONTACT CONDUCTANCE IN A VACUUM.
by M. M. Yovanovich. Nov 65, 78p NASA-CR-74619, DSR-4542-39
Contract NGR-22-009-065

Descriptors: Analysis, *Analytic function, Conduction, Conductor, Contact, Contiguity, Environment, Equation, Function, Heat, Heat conduction, Prediction, Surface, Thermal, *Thermal conductor, *Vacuum.

For abstract, see S 04 13.

N66-24595 **Field 20M**
CFSTI Prices HC$3.00 MF$0.50
Illinois Univ., Urbana.
SOME INFLUENCES OF MACROSCOPIC CONSTRICTIONS ON THE THERMAL CONTACT RESISTANCE.
by A. M. Clausing. Apr 65, 53p NASA-CR-74622, ME-TN-242-2
Grant NSG-242-62

Descriptors: Constriction, Contact, *Contact resistance, Environment, Influence, Macroscopy, Model, Numerical, Property, Resistance, Solution, Thermal, *Thermal property, *Vacuum.

For abstract, see S 04 13.

N66-24603 Field 20M
CFSTI Prices HC$6.00 MF$1.25
Lockheed Missiles And Space Co., Sunnyvale, Calif.
STUDY OF THERMAL ISOLATION TECHNIQUES FINAL ENGINEERING REPORT.
1 Mar 66, 220p NASA-CR-71743, M-92-66-1
Contracts NAS7-100, JPL-950950
Prepared For Jpl

Descriptors: Component, Cycle, Equipment, Heat, *Heat treatment, Instrumentation, *Isolation, Material, Parameter, Protection, Spacecraft, *Spacecraft instrumentation, *Sterilization, Structure, System, Technique, Thermal, *Thermal protection, Treatment.

For abstract, see S 04 13.

N66-24697 Field 20M
CFSTI Prices HC$2.00 MF$0.50
General Electric Co., Cincinnati, Ohio.
POTASSIUM CORROSION TEST LOOP DEVELOPMENT QUARTERLY PROGRESS REPORT NO. 9, 15 JUL. - 15 OCT. 1965.
by E. E. Hoffman. 1965, 48p NASA-CR-54912
Contract NAS3-2547

Descriptors: Boiler, Chamber, Characteristics, Condenser, Corrosion, *Corrosion test, Design, Flow, *Loop, Meter, Performance, *Performance characteristics, *Potassium, Pressure, Prototype, Temperature, Test, Turbine.

For abstract, see S 04 13.

N66-24875 Field 20M
CFSTI Prices HC$3.00 MF$0.75
Chalmers Univ. Of Technology, Goteborg (Sweden).
SIMULTANEOUS MASS AND HEAT TRANSFER IN THE SYSTEM - PURE LIQUID - INERT GAS.
by A. Jernqvist. 1965, 79p REPT.-1
Its Trans., No. 297

Descriptors: Adiabat, *Adiabatic equation, Change, Coefficient, Equation, Film, Gas, Heat, *Heat transfer, Inert, Liquid, *Liquid-gas mixture, Mass, *Mass transfer, Mixture, Rare, *Rare gas, State, Transfer, Vapor.

For abstract, see S 04 13.

N66-24924 Field 20M
CFSTI Prices KC$1.00 MF$0.50
National Aeronautics And Space Administration, Washington, D. C.
THE LAMINAR BOUNDARY LAYER IN A RADIATING- ABSORBING GAS NEAR A FLAT PLATE.
Laminarnyy Pogranichnyy Sloy V zluchay-ushche-pogloshchayushchem Gaze Okolo Ploskoy Plastinki
by V. P. Zamurayev. May 66, 18p NASA-TT-F-10177
Transl. Into English From Zh. Prik. Mekhan. I Techn. Fiz. (Moscow), No. 3, 1964 P 73-80

Descriptors: Absorption, Black, Boundary, *Boundary layer, Equilibrium, Flat, *Flat plate, Flow, Gas, Gray, *Gray gas, Laminar, Laminar flow, Layer, Local, Plate, Radiation, State, Steady, *Steady state, Thermodynamic, Wall.

For abstract, see S 04 13.

N66-24930 Field 20M
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
INITIAL INVESTIGATION OF A METHOD WHEREBY A CRYOGENIC PROPELLANT LIQUID IS INSULATED FROM HEAT LEAK BY THE PROPELLANT AND ITS SACRIFICIAL BOILOFF.
by W. A. Olsen. May 66, 39p NASA-TN-D-3228

Descriptors: Bag, *Boiling, Cryogenic, *Cryogenic propellant, Film, Hydrogen, Insulation, Liquid, *Liquid hydrogen, Plastic, Propellant, Tank, Thermal, *Thermal insulation, Thin, Wall.

For abstract, see S 04 13.

N66-24936 Field 20M
CFSTI Prices HC$1.00 MF$0.50
National Bureau Of Standards, Washington, D. C.
THE NEW TUNGSTEN-FILAMENT LAMP STANDARDS OF TOTAL IRRADIANCE.
by W. B. Fussell, W. E. Schneider, and R. Stair.
8 Apr 66, 22p NASA-CR-74715, NBS-9084
NASA ORDER R-116

Descriptors: Accuracy, Apparatus, Black, *Black body radiation, Body, Calibration, Filament, Instrumentation, *Irradiation, *Lamp, Measuring, Method, Radiance, Radiation, Spectral, *Standard, Thermal, Total, Tungsten.

For abstract, see S 04 13.

N66-24938 Field 20M
CFSTI Prices HC$4.00 MF$0.75
Space Technology Labs., Inc., Redondo Beach, Calif.
AN INVESTIGATION OF THE THERMAL RADIATION PROPERTIES OF CERTAIN SPACECRAFT MATERIALS FINAL REPORT.
by J. T. Bevans, G. L. Brown, E. E. Luedke, W. D. Miller, and K. E. Nelson. 31 Dec 62, 104p
NASA-CR-74772, STL-8633-6014-SU-000
Contract NAS5-1102

Descriptors: Acid, Alloy, *Aluminum, *Anode, Anodization, Control, Degradation, Environment, Process, Radiation, Space, *Space environment, *Spacecraft, Sulfuric, Temperature, *Temperature control, Thermal, *Thermal radiation, Ultraviolet, Vacuum.

For abstract, see S 04 13.

N66-24993 Field 20M
CFSTI Prices HC$3.00 MF$0.75
National Bureau Of Standards, Washington, D. C.
A SURVEY OF THERMODYNAMIC PROPERTIES OF THE COMPOUNDS OF THE ELEMENTS CHNOPS SEVENTH PRELIMINARY REPORT, 1 JAN. - 31 MAR. 1966.
by G. T. Armstrong, M. K. Buresh, G. T. Furukawa, G. D. Mitchell, and M. L. Reilly. 1 Apr 66, 74p NASA-CR-74719, NBS-9089
NASA ORDER R-138

Descriptors: Capacity, Carbon, Chemical, *Chemical compound, Compound, Element, Energy, Formation, Function, Furan, Heat, *Heat capacity, Hydrogen, Inorganic, Methionine, Nitrogen, Organic, Oxygen, Phosphorus, Property, Serine, Sulfur, *Thermochemistry, Thermodynamic, *Thermodynamic property, Urea.

For abstract, see S 04 13.

N66-25163 Field 20M
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala. Warner And Swasey Co., Flushing, N. Y.
USE OF THE CURTIS- GODSON APPROXIMATION IN CALCULATIONS OF RADIANT HEATING BY INHOMOGENEOUS HOT GASES.
by H. J. Babrov, B. Krakow, G. J. Maclay, and A. L. Shabott. 15 Mar 66, 32p NASA-TM-X-53411
Contract NAS8-11315
Prepared By Warner And Swasey Co.

Descriptors: Carbon dioxide, Gas, Heating, Hot, *Hot gas, Infrared, Inhomogeneity, Optical, Path, Radiance, *Radiant heating, Spectral, Transmittance, Water.

For abstract, see S 04 13.

N66-25174 Field 20M
CFSTI Prices HC$2.00 MF$0.50
Deutsche Versuchsanstalt Fur Luft- Und Raumfahrt, Porz (West Germany).
MEASUREMENTS OF RELAXATION EFFECTS IN NOZZLE FLOW OF HOT COMBUSTION GASES BY MEANS OF A SHOCK TUBE TECHNIQUE.
Messungen Von Relaxationseffekten In Dusenstromungen Heisser Verbrennungsgase Mittels Einer Stozsrohranordnung
by T. Just, and H. Pippert. Jan 66, 43p DLR-FB-66-01
In German, English Summary

Descriptors: Angle, *Chemical relaxation, Combustion, Detonation, Effect, Flow, Gas, Hot, *Hot gas, Hydrocarbon, Measurement, Nozzle, *Nozzle flow, Oxygen, Shock, *Shock tunnel, Technique, Temperature, *Temperature measurement, Tunnel, Wave.

For abstract, see S 04 13.

N66-25246 Field 20M
CFSTI Prices HC$3.00 MF$0.50
Aerojet-general Corp., Sacramento, Calif.
COOLDOWN OF LARGE-DIAMETER LIQUID HYDROGEN AND LIQUID OXYGEN LINES.
by J. C. Commander, and M. H. Schwartz. 20 Apr 66, 60p NASA-CR-54809, AGC-8800-54
Contract NAS3-2555

Descriptors: Chill, Cooling, *Cooling system, Cryogenic, *Cryogenic propellant, Diameter, Facility, Hydrogen, Large, Line, Liquid, *Liquid propellant, *M- 1 rocket engine, Pipe, Propellant, System, Test, *Test facility.

For abstract, see S 04 13.

N66-25248 Field 20M
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
ENERGY TRANSPORT BY THERMAL FIELD EMISSION.
by J. F. Morris. May 66, 20p NASA-TN-D-3448

Descriptors: Electron, Emission, Emitter, Energy, *Energy transfer, Fermi statistics, Field, *Heat transfer, Surface, Thermal, *Thermal emission, Transfer, Transport.

For abstract, see S 04 13.

N66-25307 Field 20M
CFSTI Prices HC$5.00 MF$1.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROGRAM PLAN FOR EARTH-ORBITAL LOW G HEAT TRANSFER AND FLUID MECHANICS EXPERIMENTS.
by C. D. Arnett, and M. E. Nein. 10 Feb 66, 163p
NASA-TM-X-53395

Descriptors: Design, Earth, Environment, Experiment, *Experiment design, Fluid, *Fluid mechanics, Heat, *Heat transfer, Low gravity, Mechanics, Orbital, Plan, Program, Space, *Space environment, Transfer.

For abstract, see S 04 13.

N66-25375 Field 20M
CFSTI Prices HC$2.00 MF$0.50
General Electric Co., Philadelphia, Pa.
TRANSIENT DETERMINATION OF THE THERMAL CONDUCTIVITY OF A LOW DENSITY PHENOLIC NYLON CHAR FINAL REPORT.
23 Jul 65, 39p NASA-CR-66099
Contract NAS1-2979-1

Descriptors: Ablation, *Char, Heat, Heating, Hypersonic, Low density, *Nylon, *Phenol, Pyrolysis, Reentry, Shield, State, Steady, *Thermoconductivity, Transient.

For abstract, see S 04 13.

N66-25376 **Field 20M**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A CALCULATION METHOD FOR THE ABLATION OF GLASS-TIPPED BLUNT BODIES.
by J. D. Warmbrod. 12 Apr 66, 91p NASA-TM-X-53427

Descriptors: *Ablation, Analysis, Atmospheric, *Atmospheric entry, Blunt, *Blunt body, Body, Calculation, Characteristics, Entry, *Glass, Point, Sphere, Stagnation, Tektite, Tip, Trajectory, *Trajectory analysis.

For abstract, see S 04 13.

N66-25552 **Field 20M**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SETS OF SIMILARITY RATIOS FOR THERMAL MODELING.
by J. R. Watkins. May 66, 46p NASA-TN-D-3452

Descriptors: Environment, Independence, *Mathematical table, Mathematics, Modeling, Number, Ratio, Similarity, *Similarity number, Simulation, Space, *Space environment, Table, Thermal.

For abstract, see S 04 14.

N66-26691 **Field 20M**
CFSTI Prices HC$3.00 MF$0.75
Northrop Space Labs., Hawthorne, Calif.
RESEARCH AND DEVELOPMENT STUDY ON THERMAL CONTROL BY USE OF FUSIBLE MATERIALS FINAL REPORT, MAR. 1964 - MAR. 1966.
by E. W. Bentilla, L. E. Karre, and R. F. Sterrett. Apr 66, 70p NASA-CR-75041, NSL-65-16-1
Contract NAS8-11163

Descriptors: Change, Control, Design, Fusion, Liquid, *Melting, *Packaging, Paraffin, Phase, Property, Solid, *Solidification, Spacecraft, System, *Systems design, Temperature, *Temperature control, Thermophysical.

For abstract, see S 04 14.

N66-26858 **Field 20M**
CFSTI Prices HC$2.00 MF$0.50
Oklahoma State Univ., Stillwater.
DESIGN CONSIDERATIONS FOR THERMOSTATIC FIN SPACECRAFT TEMPERATURE CONTROL.
by G. J. Kneissl, C. A. Morgan, and J. A. Wiebelt. May 66, 34p NASA-CR-500
Grant NSG-454

Descriptors: Absorption, Control, Design, Earth, Emission, Fin, Groove, Skin, Solar, Spacecraft, *Spacecraft design, Temperature, *Temperature control, *Thermostat.

For abstract, see S 04 14.

N66-34208 **Field 20M**
CFSTI Prices HC$2.50 MF$0.75
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL INVESTIGATION OF BAFFLE EFFECTIVENESS IN A CONFINED FLUID SUBJECTED TO WALL AND NONUNIFORM SOURCE HEATING.
by T. J. Biesiadny. Aug 66, 66p NASA-TM-X-52236

Descriptors: Alcohol, *Baffle, Ethyl, *Heating, Hydrogen, Infrared, Liquid, *Liquid hydrogen, Nonuniform, Propellant, *Propellant tank, Radiation, Simulation, Tank, Wall.

For abstract, see S 04 20.

N66-34373 **Field 20M**
CFSTI Prices HC$2.50 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
DIRECT CALCULATION OF SPECIFIC HEATS AND RELATED THERMODYNAMIC PROPERTIES OF ARBITRARY GAS MIXTURES WITH TABULATED RESULTS.
by D. O. Allison, and P. A. Newman. Aug 66, 57p NASA-TN-D-3540

Descriptors: Atmosphere, Calculation, Gas, *Gas mixture, Heat, Ideal, Mars, *Mars atmosphere, Mixture, Model, Planet, Property, Simulation, Specific, *Specific heat, *Table, Thermodynamic, *Thermodynamic property.

For abstract, see S 04 20.

N66-34430 **Field 20M**
CFSTI Prices HC$3.25 MF$1.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HEAT TRANSFER COMPUTER PROGRAMS.
1964, 167p NASA-TM-X-56166
Proc. Of Conf. Held At Nasa Headquarters, 7 May 1964

Descriptors: Analysis, Computer, *Computer program, *Conference, Design, Flux, Heat, *Heat transfer, Method, *Monte carlo method, Program, Radiation, *Satellite, Spacecraft, *Spacecraft design, Surface, Temperature, Thermal, Transport.

For abstract, see S 04 20.

N66-34858 **Field 20M**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
CALCULATION OF THERMODYNAMIC PROPERTIES OF ARBITRARY GAS MIXTURES WITH MODIFIED VIBRATIONAL-ROTATIONAL CORRECTIONS.
by D. O. Allison. Aug 66, 45p NASA-TN-D-3538

Descriptors: Air, Atmosphere, Carbon, Computation, Correction, Diatomic, Dioxide, Equilibrium, Gas, *Gas mixture, High temperature, *High temperature gas, Mars, Mixture, Model, Property, Rotation, *Thermodynamic equilibrium, Thermodynamics, Vibration.

For abstract, see S 04 20.

N66-34860 **Field 20M, 14E**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
A VISUAL STUDY OF VELOCITY AND BUOYANCY EFFECTS ON BOILING NITROGEN.
by F. F. Simon, and R. J. Simoneau. Sep 66, 27p NASA-TN-D-3354
Film Supplement Number C-245 To This Report Is Available On Loan From Lewis Research Center

Descriptors: Boiling, Buoyancy, Camera, Channel, Data, Flow, *Flow velocity, Flux, Heat, High speed, *High speed camera, Liquid, *Liquid nitrogen, Motion, Nitrogen, Nucleate, *Nucleate boiling, Orientation, Photography, Picture, Slant, Transfer, Vapor, Velocity.

For abstract, see S 04 20.

N66-34936 **Field 20M**
CFSTI Prices HC$1.00 MF$0.50
Parametrics, Inc., Waltham, Mass.
ULTRASONIC TEMPERATURE MEASURING DEVICE FOURTH QUARTERLY PROGRESS REPORT.
by E. H. Carnevale, S. L. Klaidman, and L. C. Lynnworth. Jul 66, 12p NASA-CR-72037
Contract NAS3-7981

Descriptors: Annealing, Apparatus, Cycle, Device, Measurement, *Measuring apparatus, *Molybdenum, *Rhenium, Sound, Temperature, *Temperature measurement, Testing, Ultrasonic, *Ultrasonic testing, Velocity, Wire.

For abstract, see S 04 20.

N66-35209 **Field 20M**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Ames Research Center, Moffett Field, Calif.
EFFECT OF DISCONTINUITIES IN SURFACE CATALYTIC ACTIVITY ON LAMINAR HEAT TRANSFER IN ARC-HEATED NITROGEN STREAMS.
by R. E. Sheldahl, and E. L. Winkler. Sep 66, 26p NASA-TN-D-3615
Contract 129-01-09-06

Descriptors: Activity, Aerodynamic, Arc, Boundary, Catalysis, *Catalytic activity, *Discontinuity, Effect, Flight, Flow, Gas, *Gas stream, Heat, Heating, Jet, Laminar, *Laminar heat transfer, Layer, *Nitrogen, Stream, Supersonic, Surface, Transfer, Vehicle.

For abstract, see S 04 20.

AD-638 707 **See Field 21B**

AD-638 731 **See Field 20D**

AD-638 983 **See Field 21E**

AD-639 185 **See Field 7A**

AD-639 209 **See Field 11F**

AD-639 334 **See Field 20C**

AD-639 421 **See Field 11F**

AD-639 514 **See Field 10A**

N66-24841 **See Field 1A**

20N. WAVE PROPAGATION

AD-638 803 **Field 20N, 20I**
CFSTI Prices: HC$3.00 MF$0.50
Air Force Cambridge Research Labs., L. G. Hanscom Field, Mass.
TRANSIENT SIGNAL PROPAGATION IN LOSSLESS, ISOTROPIC PLASMAS. VOLUME II.
Physical sciences research papers.
by R. E. Haskell, and C. T. Case. Jun 66, 53p AFCRL-PSRP-241, AFCRL-66-234
Proj. AF-4642
Task 464202
See also AD-634 083

Descriptors: (*Transients, Wave transmission), (*Plasma medium, Propagation), Electromagnetic pulses, Signals, Mathematical analysis.

The asymptotic behavior of transient signal propagation in lossless, isotropic plasmas is discussed at length for a typical input signal of a step modulated sine wave. A generalized saddlepoint integration is carried out that gives a continuous solution for the dispersed signal everywhere except at the

signal wavefront. The solution for the wavefront is obtained by using a high-frequency expansion technique. Universal curves are presented for the behavior of the distorted signal as a function of the plasma frequency, signal frequency, and propagation distance. The solution is a very good approximation for plasma propagation lengths that are long compared to a wavelength. (Author)

AD-638 908 **Field 20N, 4A**
CFSTI Prices: HC$5.00 MF$1.00
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
VLF RAY TRACING IN A MODEL IONOSPHERE.
Doctoral thesis.
by Stanley D. Shawhan. Aug 66, 187p Rept. no. 66-33
Contract Nonr-1509 (06)

Descriptors: (*Ionospheric propagation, Very low frequency), Whistlers, Model theory, Graphics.

A VLF ray tracing study in a model ionosphere including ions is presented. A review of previous VLF ray tracing methods is given. The physical meaning of rays and ray paths is discussed and it is concluded that for ray tracing in the ionosphere the wave packet and Poynting vector approaches give the same results. Two-dimensional ray tracing equations are derived for the case of a horizontally stratified ionosphere and the derivation of three dimensional equations are integrated for the special cases of exactly transverse and exactly longitudinal propagation but it is concluded that neither case can persist for very-low-frequency radio waves in the ionosphere. Also the condition for reversibility of a ray path are derived. It is found that the computer program for numerical integration of the ray tracing equations can retrace a path to 0.3% in latitude and 0.02% in wave normal angle and can reproduce known results for the horizontally stratified model. (Author)

AD-638 948 **Field 20N**
Not available from CFSTI.
Illinois Univ., Urbana. Antenna Lab.
RADIATION FROM A MODULATED CORRUGATED SURFACE EXCITED BY A WAVEGUIDE.
Revised ed.
by D. S. Karjala, and R. Mittra. 28 Feb 66, 8p
Grant DA-ARO (D)-31-124-G646
AROD-5405:1
Research supported in part by Air Force Cambridge Research Labs.
Availability: Published in Proc. IEE v113 n7 p1143-50 Jul 66.

Descriptors: (*Propagation, Surfaces), (*Wave functions, Propagation), Modulation, Configuration, Waveguides, Antenna radiation patterns.

A formally exact solution to the problem of radiation from a modulated corrugated surface excited by a waveguide is obtained. Results are given for the reflection coefficient, the radiation pattern, the k/beta diagram and the amplitudes of the surface waves launched. Some numerical results are included. (Author)

AD-639 253 **Field 20N, 17B, 9B**
CFSTI Prices: HC$3.00 MF$0.50
Navy Electronics Lab., San Diego, Calif.
CALCULATION OF SIGNAL-TO-NOISE RATIO FOR HF PROPAGATION PREDICTION.
Research and development rept., Apr 64-Apr 66.
by D. B. Sailors. 21 Jun 66, 58p NEL-1383
Projs. SS 261001, NEL-B13961
Task 7429

Descriptors: (*Signal-to-noise ratio, Determination), (*Radio waves, Propagation), High frequency, Ionospheric propagation, Programming (Computers), Gain, Log periodic antennas.

Identifiers: NELIAC, CDC 1604.

Calculation of signal-to-noise ratio for operational sky-wave modes at high frequency is described. The process applies to a computer program written in NELIAC 5M for the CDC 1604. Calculation includes factors of field strength, antenna gain, signal voltage, and noise. Noise data used are based on CCIR Report No. 65. Configurations for most hf antennas, including log periodic, are provided for. Means are provided for comparing NEL and CRPL program results. The NELIAC 5M program is presented in NEL Report 1358 (AD-633 716). Selection of operational modes is covered in NEL Report 1364 (AD-633 893). (Author)

AD-639 499 **Field 20N**
CFSTI Prices: HC$2.00 MF$0.50
Colorado Univ., Boulder. Dept. of Electrical Engineering.
THE GROUND-WAVE ATTENUATION FUNCTION FOR PROPAGATION OVER A HIGHLY INDUCTIVE SURFACE.
by R. J. King, and G. A. Schlak. 1 Aug 66, 33p
Scientific-37
Contract PRO-65-504
Proj. AF-4600
Task 460004
AFCRL-66-603

Descriptors: (*Radio waves, Propagation), (*Electromagnetic waves, Attenuation), Wave functions, Inductance, Surfaces, Electrical impedance.

Propagation of an electromagnetic ground wave over a plane surface in which the argument of the surface impedance is greater than wavelength/4 but less than wavelength/2 is considered in some detail. The numerical distance, p, over such a surface is characterized by $0 < \text{or} = \arg p < \text{or} = \text{wavelength}/2$. The ground wave behaves in a rather unusual manner, and this is attributed to the interaction of phasors representing a trapped wave and a Norton surface wave. Approximate expressions are derived which determine the magnitude of the ground wave attenuation function at its maxima and minima as well as the phase at these points and the numerical distances where these maxima and minima occur. A method is also given for estimating the asymptotic phase for large absolute valve of p which was previously not possible. Finally, detailed curves are presented which show the amplitude and phase of the ground wave attenuation function versus p. These curves should prove useful to practicing radio engineers attempting to make calculations for surface wave propagation over corrugated, stratified or rough surfaces. (Author)

AD-639 500 **Field 20N**
CFSTI Prices: HC$3.00 MF$0.75
Colorado Univ., Boulder. Dept. of Electrical Engineering.
AN EXPERIMENTAL STUDY OF GROUND WAVE PROPAGATION ACROSS SEMI-INFINITE STRIPS AND ISLANDS.
by W. I. Tsukamoto, R. J. King, and S. W. Maley. 17 Mar 66, 70p Scientific-35
Contract PRO-65-504
Proj. AF-4600
Task 460004
AFCRL-66-252

Descriptors: (*Radio waves, Propagation), Low frequency, Very low frequency, Electromagnetic waves, Terrain, Lakes, Islands, Phase measurement, Experimental data, Wave functions.

Experimental amplitude and phase measurements of electromagnetic ground wave propagation across semi-infinite strips and islands were conducted for normal incidences. Models for propagation were used with aluminum plates simulating highly conducting media and water simulating imperfectly conducting media. The frequency used was 4.2937 Gc/s. An open-end waveguide located at the water surface and a small switching dipole were used as the transmitting and receiving antennas, respectively. Both amplitude and phase measurements were made by using a modulated scattering dipole technique. The theoretical formulation for normal incidence very low frequency (VLF) ground wave propagation across a simple mixed path was developed by J. R. Wait, using a perturbation technique. Wait's work was extended to semi-infinite strips and islands by R. J. King who used an equiavalent formulation in an elliptic coordinate system. In both formulations, an approximate solution for the ground wave attenuation function was obtained. Computer methods were used by King for numerical calculations. The experimental data obtained verified the theoretical calculations and also substantiated the limitations of theory implied in the formulation. (Author)

AD-639 560 **Field 20N**
CFSTI Prices: HC$2.60 MF$0.50
RAND Corp., Santa Monica, Calif.
MEASUREMENTS OF EFFECTIVE RADIATED POWERS.
by M. N. Lustgarten. 17 Aug 60, 22p P-2078

Descriptors: (*Antenna radiation patterns, Measurement), Effectiveness, Radiofrequency power, Approximation (Mathematics), Gain, Statistical analysis.

It can be seen that for signal density predictions and tests for conformance with statistical specifications, the analytic model described in this paper seems quite adequate. A field measurement technique could employ pulse counting and record the required pulse patterns directly. If many runs are made, the standard deviations could also be included. Thus, the patterns could be placed on tape in a form suitable for use by a computer programmed to solve signal density problems. It is of little consequence to the model whether a peak or a null appears at a specific angle. Detailed pattern plots would not be required, alleviating the requirement for precision in determining azimuth angles. Therefore, measurement accuracy of this parameter seems not to be markedly significant for signal density predictions, simplifying the measurement technique and the method for data presentation. If azimuth accuracy is preserved, the measurements will be useful to engineers involved in siting problems and the data can still be converted to the form described in this paper. Finally, the statistical model provides the system planner with a definite quantitative estimate of the confidence that can be placed on the measured data. This will provide a sound engineering basis for equipment design and will also point clearly toward those areas where improved measurement techniques and measurement equipment are required. Incidentally, it will also indicate where relatively crude techniques (whose errors are known) are acceptable. (Author)

AD-639 584 **Field 20N**
CFSTI Prices: HC$1.00 MF$0.50
Rome Air Development Center, Griffiss AFB, N. Y.
ELECTROMAGNETIC COMPATIBILITY: A POSITION PAPER.
by Woodrow W. Everett Jr, and Robert Powers.
Sep 66, 25p RADC-SP-66-4
Presented at the Electromagnetic Compatibility (EMC) Symposium, San Francisco, Calif., 11-13 Jul 66.

Descriptors: (*Electromagnetic compatibility, State-of-the-art reviews), Control.

Consideration is directed toward electromagnetic compatibility as viewed from the control aspect. Emphasis is upon an intersystem approach of improving the overall electromagnetic environment. (Author)

NBS-TN-335 **Field 20N**
CFSTI Prices: HC$0.25 MF$0.50

Environmental Sciences Services Administration, Boulder, Colo. Inst. for Telecommunication Sciences and Aeronomy.
ZONAL HARMONICS IN LOW FREQUENCY TERRESTRIAL RADIO WAVE PROPAGATION.
by J. Ralph Johler. 13 Apr 66, 27p
Also available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.25.

Descriptors: (*Radio waves, Propagation), Low frequency, Very low frequency, Extremely low frequency, Harmonic analysis.

N66-24492 **Field 20N**
CFSTI Prices HC$4.00 MF$1.00
Michigan Univ., Ann Arbor.
RADIATION DUE TO AN OSCILLATING DIPOLE OVER A LOSSLESS SEMI-INFINITE MOVING DIELECTRIC MEDIUM.
by V. P. Pyati. Feb 66, 124p NASA-CR-74550
Contract NGR-23-005-107, Grant NSG-572
Its Rept.-7322-2-t

Descriptors: Boundary, *Boundary value problem, Charge, Dielectric, *Dipole, *Electrodynamics, Field, Lossless, Medium, Moving, Oscillation, Plane, Problem, Radiation, *Radiation field, Reflection, Refraction, Semi-infinite, Solution, Stationary, Value, Wave.

For abstract, see S 04 13.

N66-24805 **Field 20N**
CFSTI Prices HC$1.10 MF$0.50
Genoa Univ. (Italy).
UPPER ATMOSPHERE VLF SOURCE (ON WHISTLERS AND VLF EMISSIONS RECORDED AT ROBURENT, NORTH ITALY FINAL REPORT.
by M. Bossolasco, A. Caneva, G. Cicconi, I. Dagnino, and A. Elena. Oct 65, 4p AFCRL-66-39, AD-628809
Contract AF 61)052/-591

Descriptors: Atmosphere, Density, Diurnal, *Diurnal variation, Electron, Emission, Ionosphere, Magnetosphere, Meteorology, Propagation, Recorder, Upper, *Upper atmosphere, Variation, Very low frequency, *Very low frequency emission recorder, *Whistler.

For abstract, see S 04 13.

N66-35066 **Field 20N, 9E**
CFSTI Prices HC$1.00 MF$0.50
Rome Univ. (Italy).
EXPERIMENTAL VERIFICATION OF THE THEORETICAL BEHAVIOUR OF SOME FERRITE STRUCTURES INTERIM SCIENTIFIC REPORT NO. 3.
by G. Gerosa, and C. M. Ottavi. 22 Feb 66, 7p
AFCRL-66-390, AD-634974
Contract AF 61/052/-807

Descriptors: Equipment, *Ferromagnetism, Frequency, Microwave, *Microwave apparatus, Power, Radio, Transmission, Wave.

For abstract, see S 04 20.

N66-35186 **Field 20N**
CFSTI Prices HC$1.00 MF$0.50
Centro Brasileiro De Pesquisas Fisicas, Rio De Janeiro.
ON THE SOLUTION OF THE ELECTROMAGNETIC EQUATIONS FOR ROTATING SYSTEMS.
by R. C. Da costa, and I. Wolk. 1965, 15p
Its Notas De Fisica Vol. 12, No. 1

Descriptors: Electromagnetic, *Electromagnetic propagation, Energy, Equation, Field, Flow, Gravitational, *Gravitational field, Maxwell equation, Momentum, Propagation, Relativity, Rotation, *Rotational flow, Tensor.

For abstract, see S 04 20.

AD-638 783 **See Field 20I**

AD-639 463 **See Field 3B**

AD-639 487 **See Field 12A**

NBS-M-92 **See Field 4B**

NBS-TN-18-26 **See Field 17B**

NBS-TN-337 **See Field 4A**

21B. COMBUSTION AND IGNITION

AD-638 707 **Field 21B, 20M**
Not available from CFSTI.
New York Univ., N. Y. Dept. of Chemistry.
A THEORETICAL STUDY OF FLAME PROPERTIES AS A FUNCTION OF THE CHARACTERISTICS OF FLAME GASES.
Revised ed.
by E. S. Campbell, F. J. Heinen, and L. M. Schalit. 12 Jul 65, 38p
Contract AF 49 (638)-169
Proj. AF-9751
Task 975101
AFOSR-66-1728
Availability: Published in Philosophical Transactions of the Royal Society of London serA v259 n1101 p355-89 Apr 21 1966.

Descriptors: (*Flames, Thermodynamics), Diffusion, Approximation (Mathematics), Energy, Transport properties, Partial differential equations, Dynamics, Gases.

General equations are presented for a method of calculating the net rate of production and the fractional mass-flow rate for each species without introducing the kinetic steady-state approximation. Mathematical problems of smoothness and stability which must be surmounted in any method which avoids the kinetic steady-state approximation are discussed. Various methods were applied to numerous numerical integrations of the hydrodynamic equations for a one-dimensional time-independent flame with idealized kinetics and transport properties. (Author)

AD-638 897 **Field 21B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
TEST-STAND STUDY OF A FORCED JET CHAMBER FOR LIQUID FUEL.
by V. I. Khovostov, and V. I. Solonin. 31 Aug 66, 21p FTD-HT-66-195
TT-66-62236
Unedited rough draft trans. of Teploenergetika (USSR) v10 n5 p77-81 1965.

Descriptors: (*Combustion chambers, Design), Fuels, Liquids, Jets, Combustion, USSR.

Results are presented of experimental investigation in an effort to find the optimum design and variant of mode of operation of a forced jet combustion chamber for liquid fuel. (Author)

AD-638 993 **Field 21B, 21H**
CFSTI Prices: HC$3.00 MF$0.75
Boeing Scientific Research Labs., Seattle, Wash. Mathematics Research Lab.
INFLUENCE OF ACCELERATION ON COMBUSTION IN A ROCKET ENGINE.
by F. Edward Ehlers. Jun 66, 68p D1-82-0541, Mathematical note-470

Descriptors: (*Rocket motors, Combustion), (*Combustion, Acceleration), Equations of motion, Nozzles, Liquid rocket propellants.

The influence of acceleration was analyzed under the following assumptions: The velocity distribution of the quasi-one-dimensional steady state flow through the nozzle is linear in the axial variable. Combustion occurs at a fixed point in the nozzle and at a constant temperature. Burning rate for a solid propellant is proportional to a power n of the chamber pressure. For a liquid propellant with injection rate unaffected by the acceleration, the ratio of burning rate to injection rate is equal to the power of n of the ratio of the instantaneous pressure and the pressure at an earlier time determined by the time lag in the combustion process. For the liquid propellant with time lag, instability occurs for some values of time lag and of the burning rate parameter n. From the linearized solutions, a stability diagram was drawn in the plane of the time lag and burning rate parameter n. Increasing either time lag or the combustion rate exponent from neutrally stable values produces instability. The effect of increasing the magnitude of acceleration appears to shift the neutral curve to lower values of time lag and the burning rate exponent. (Author)

AD-639 063 **Field 21B, 21D, 21H**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
CERTAIN PROBLEMS OF UNSTABLE COMBUSTION IN ROCKET ENGINE CHAMBERS DRIVEN BY LIQUID FUEL.
by H. Krajewski. 18 Apr 66, 18p FTD-TT-65-1728
TT-66-62276
Unedited rough draft trans. of Technika Lotnicza (Poland) n12 p302-5 1964.

Descriptors: (*Combustion, *Rocket motors (Liquid propellant)), (*Liquid rocket fuels, Combustion), Combustion chambers, Poland, Stability.

The monograph discusses only certain problems of unstable combustion in a rocket engine combustion chamber, namely, the types of instability, their manifestations, causes, and possible results for the drive, stability criteria and conclusions.

AD-639 154 **Field 21B, 21G**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
EFFECT OF COMBUSTION CHAMBER FORM ON THE TENDENCY OF A CARBURETOR ENGINE TOWARD DETONATION.
by L. S. Sukhareva. 6 Jun 66, 25p FTD-TT-65-1857
TT-66-62283
Unedited rough draft trans. of Avtomobilnaya Promyshlennost (USSR) v30 n10 p5-10 1964.

Descriptors: (*Detonations, Combustion chambers), (*Combustion chambers, Configuration), USSR, Internal combustion engines, Gasoline, Performance (Engineering).

CONCLUSIONS: The form of the combustion chamber and the magnitude of the displacer has a great effect on the detonation tendency of the engine. A 40% increase of the displacer from the area of the ring shows positive results of engine operation, considerably reducing its detonation tendency and increasing the index of using the detonation stability of the fuel in the engine. An increase in displacer to 60%, although it gives a reduction in requirements in octane number of the fuel, but it is accompanied by an undesirable increase in rigidity and working noise of the engine. The form of the combustion chamber and the magnitude of the displacer exert a great effect on the 'sensitivity' of the engine towards changing the ignition advancement angle, and also on the power reduction and deterioration of fuel economy of the engine when using auto gasolines with octane number, smaller than the needed one. With an increase in displacer the 'sensitivity' of the engine toward the deviation of the ignition advancement angle from its optimum value increases. The form of the combustion chamber considerably affects detonational rigidity of the engine, i.e. its ability to use

the properties of 'sensitive' automobile gasolines, to change its actual octane evaluation in dependence upon exploitation conditions. It can be especially recommended the use of 'sensitive' auto gasolines for engines with wedge, cylindrical, semispherical and plane oval combustion chambers are especially recommended. (Author)

AD-639 517 **Field 21B, 7D**
Not available from CFSTI.
Manchester Coll. of Science and Technology (England). Dept. of Chemistry.
GROWTHS IN THE CONCENTRATIONS OF RADICALS IN REACTING MIXTURES OF HYDROGEN AND OXYGEN. A STUDY BY ANALOGUE COMPUTER.
Interim rept.
by D. R. Blackmore. 20 Jul 65, 12p
Grant AF-EOAR-62-88
Proj. AF-9751
Task 975101
AFOSR-66-1785
Availability: Published in Transactions of The Fåraday Society v62 n518 pt2 Feb 1966.

Descriptors: (*Hydrogen, Chemical reactions), (*Oxygen, Chemical reactions), (*Chemical reactions, Simulation), Reaction kinetics, Free radicals, Concentration (Chemistry), Combustion, Great Britain.

The times for various intermediate species to reach their quasi-steady-state concentrations in the thermal reaction between hydrogen and oxygen have been investigated using an analogue computer. Under second limit and slow reaction conditions, the growth curves of the species OH, O, H, HO2 and H2O2 were studied. The growth of all species to an overall steady-state with respect to reactants is controlled by the slowest reacting species H2O2, to which all the other species are linked in quasi-steady-states. In a similar manner, the next slowest-reacting species HO2 controls the growth of the other faster-reacting species. The times for OH, O, H, HO2 and H2O2 to reach their quasi-steady-state concentrations are shown to be roughly 0.000001, 0.0001, 0.001, 0.1 and 100 sec respectively. Computer predictions were made of some of the experimental phenomena observed in aged B2O3-coated vessels. These phenomena were attributed to a time-lag for H2O2 to reach its stationary concentrations. This interpretation was confirmed by direct computation. A brief assessment is made of the suitability of the analogue computer for investigating nonlinearly branched kinetic chain systems involving one slow-reacting species. (Author)

AD-639 518 **Field 21B, 7E**
Not available from CFSTI.
Manchester Coll. of Science and Technology (England). Dept. of Chemistry.
INHIBITION OF THE SECOND LIMIT OF THE HYDROGEN-OXYGEN REACTION BY HYDROGEN BROMIDE AND HYDROGEN CHLORIDE.
Interim rept.
by D. R. Blackmore, G. O'Donnell, and R. F. Simmons. 1965, 10p
Grant AF-EOAR-62-88
Proj. AF-9751
Task 975101
AFOSR-66-1791
Availability: Published in International Symposium on Combustion (10th) p303-10 1965.

Descriptors: (*Hydrogen, Chemical reactions), (*Oxygen, Chemical reactions), (*Flame propagation, Inhibition), Hydrochloric acid, Hydrogen compounds, Bromides, Reaction kinetics, Combustion, Great Britain.

Identifiers: Hydrogen bromide.

The effect of hydrogen bromide and hydrogen chloride on the second limit of the hydrogen-oxygen reaction was studied over a wide range of mixture composition and vessel diameter using barium bromide- and barium chloride-coated vessels, respectively. Hydrogen bromide was found to be a very efficient inhibitor, and, in contrast, the same quantity of hydrogen chloride has only a small effect on the explosion limit; hydrogen bromide is approximately 400 times more effective as an inhibitor than hydrogen chloride. The mechanism of the inhibition is discussed, and with hydrogen bromide it is concluded that the primary termination reaction is a removal of hydrogen atoms by the hydrogen bromide. (Author)

AD-639 526 **Field 21B, 20I**
Not available from CFSTI.
Strathclyde Univ., Glasgow (Scotland). Dept. of Mathematics.
MAGNETOGASDYNAMIC DEFLAGRATION UNDER THE CHAPMAN-JOUGUET CONDITION.
by A. R. Gordon, and J. B. Helliwell. 26 Feb 65, 8p
Grant AF-EOAR-64-6
AFOSR-66-0213
Availability: Published in Journal of Fluid Mechanics v23 pt4 p779-86 1965.

Descriptors: (*Deflagration, Magnetic fields), (*Detonation waves, Propagation), Combustion, One-dimensional flow, Shock waves, Flames, Magnetohydrodynamics, Great Britain.

Identifiers: Chapman-Jouget detonation waves.

An investigation is made into the propagation of a one-dimensional combustion wave, which consists of a flame front and a precursor shock wave which pass down a tube closed at one end, in the presence of a transverse magnetic field in the undisturbed gas at rest. The shock wave is assumed to be of sufficient strength to ionize completely the initially non-electrically-conducting gas and the conditions at the flame front are taken to satisfy the Chapman-Jouguet condition. Details of the solution are compared with the corresponding results for ordinary gasdynamic deflagration. (Author)

AD-639 573 **Field 21B**
Not available from CFSTI.
Louvain Univ. (Belgium). Lab. of Inorganic Chemistry.
THE STABILIZATION MECHANISM OF LIFTED DIFFUSION FLAMES.
by L. Vanquickenborne, and A. Van Tiggelen. May 65, 13p
Grant AF-EOAR-42-63
Proj. AF-9750
Task 975002
AFOSR-66-1800
Availability: Published in Combustion and Flame v9 n4 p59-69 Dec 1965.

Descriptors: (*Flames, Stabilization), Jet flames, Methane, Combustion products, Gas flow, Intensity, Turbulence, Burning rate, Belgium.

Measurements on gas composition, gas flow velocity, intensity and Eulerian scale of turbulence were made in a free jet of methane emerging from a conventional circular burner into an unconfined atmosphere. From the experimental data it appears that the base of a lifted diffusion flame anchors in a region where a stoichiometric composition is attained. Accepting the assumption that the turbulent burning velocity Vt equals the gas flow velocity in this region, an experimental relation is obtained between Vt and the parameters of turbulence. Finally the stabilization conditions are discussed; blow off and drop back of the flame are explained by the interaction between aerodynamic flow patterns and burning velocity. (Author)

N66-23984 **Field 21B**
CFSTI Prices HC$3.60 MF$0.50
Trinity Coll., Dublin (Ireland).
MECHANICAL VIBRATION - A DRIVING MECHANISM FOR COMBUSTION INSTABILITY IN ROCKET ENGINES.
by D. Cochrane, L. Crane, and P. D. Mc cormack. Nov 65, 32p AFOSR-66-0404, AD-628920
Contract AF-EOAR-65-43

Descriptors: Air, Analysis, Burning, Combustion, *Combustion instability, Effect, Gas, Injector, Instability, Jet, *Jet mixing, Mixing, Photographic, *Rocket engine, Vibration, *Vibration effect, Vortex.

For abstract, see S 04 13.

PB-170 858 **Field 21B, 21H**
CFSTI Prices: HC$2.60 MF$0.50
Weapons Research Establishment, Salisburg (Southy Australia).
CONVECTIVE HEATING ON A ROCKET EFFLUX DEFLECTOR.
Technical note.
by G. Jepps, and M. L. Robinson. Mar 66, 27p HSA-113

Descriptors: (*Convection (Heat transfer), Flame deflectors), (*Rocket components, Flame deflectors), Stagnation point, Exhaust flames, Australia.

To provide data for the design of uncooled rocket efflux deflectors, an investigation of the heating rates in the Blue Streak installation at Woomera has been carried out theoretically and experimentally. The heat transfer coefficient and stagnation temperature at the efflux deflecting surface are calculated theoretically with the aid of model test results. Heat transfer coefficients derived from temperature measurements on steel plates embedded in the deflecting surface are compared with the theoretical results. It is concluded that simple aerodynamic heat transfer theory can provide an effective engineering estimate of the temperature rise of an efflux deflecting surface. (Author)

AD-638 982 **See Field 21E**

AD-638 987 **See Field 21E**

AD-638 988 **See Field 21E**

AD-639 021 **See Field 21I**

AD-639 153 **See Field 13H**

21C. ELECTRIC PROPULSION

AD-639 347 **Field 21C, 22B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
THE PLASMA ROCKET: A PROMISING INNOVATION IN ROCKETRY.
11 Aug 66, 9p FTD-TT-65-1886
TT-66-62321
Edited trans. of Repules (Hungary) v18 n5 p14-5 1965.

Descriptors: (*Plasma engines, *Spacecraft), Hungary, USSR, Mars probes.

N66-24381 **Field 21C**
CFSTI Prices HC$5.00 MF$1.00
Hughes Research Labs., Malibu, Calif.
DEVELOPMENT OF LINEAR-STRIP ION THRUSTORS FOR ATTITUDE CONTROL SUMMARY REPORT.
by J. R. Anderson, R. Kuberek, and S. A. Thompson. 13 Jan 66, 160p NASA-CR-54673
Contract NAS3-4117

Descriptors: Attitude, *Attitude control, Cesium, *Cesium engine, Contact, Control, Engine, Instrumentation, Ion, *Ionic propulsion, Propulsion, Rocket, *Rocket instrumentation, Single, Strip, *Thrustor.

For abstract, see S 04 13.

N66-24388 **Field 21C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYSIS OF N-HEPTANE VAPORIZATION IN UNSTABLE COMBUSTOR WITH TRAVELING TRANSVERSE OSCILLATIONS.
by M. F. Heidmann, and P. R. Wieber. May 66, 30p NASA-TN-D-3424

Descriptors: Analysis, Combustion, Combustor, Drop, Evaporation, Frequency, *Heptane, Instability, Model, Oscillation, Propellant, Response, Rocket, *Rocket combustor, Theory, Transverse, Travel, *Vaporization.

For abstract, see S 04 13.

N66-25544 **Field 21C**
CFSTI Prices HC$6.00 MF$1.00
General Electric Co., Philadelphia, Pa. Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
FEASIBILITY ASSESSMENT OF A SOLID PROPELLANT ELECTRIC THRUSTER (SPET) FINAL REPORT.
15 Mar 66, 271p NASA-CR-74953, DOC.-66SD4255
Contracts NAS7-100, JPL-951102
Prepared For Jpl

Descriptors: Detonation, Electric, *Electricity, Electromagnetic, Induction, Low density, Mode, Noise, Pressure, Propellant, Propulsion, Solid, *Solid propellant, Spacecraft, *Spacecraft propulsion, Temperature, *Thrustor.

For abstract, see S 04 14.

N66-26273 **Field 21C**
CFSTI Prices HC$9.26 MF$3.00
Hughes Research Labs., Malibu, Calif.
ION THRUSTOR ELECTRODE SURFACE PHYSICS STUDIES SUMMARY REPORT.
by R. G. Wilson. 1965, 626p NASA-CR-54680, HRL-6278-SR
Contract NAS3-6278
With Suppl.

Descriptors: Cesium, *Cesium ion, Critical, Desorption, *Electrode, Emission, Energy, Envelope, Ion, *Ion emission, Temperature, *Thrustor, Vacuum, Work.

For abstract, see S 04 14.

N66-26548 **Field 21C**
CFSTI Prices HC$2.00 MF$0.50
California Univ., Berkeley.
INVESTIGATION OF KILOVOLT ION SPUTTERING QUARTERLY PROGRESS REPORT, FEB. - APR. 1966.
by F. C. Hurlbut, T. H. Pigford, and H. P. Smith Jr. 30 Apr 66, 29p NASA-CR-54907
Contract NAS3-5743
Its Ser. 7, Issue 22

Descriptors: Aluminum, Arc, Beam, Bombardment, Cesium, *Cesium ion, Crystal, Density, Electrode, Ion, *Ion bombardment, Mercury, Molybdenum, *Sputtering, Surface, Target, Voltage.

For abstract, see S 04 14.

N66-26861 **Field 21C**
CFSTI Prices HC$4.00 MF$0.75
Mcdonnell Aircraft Corp., St. Louis, Mo.
STUDY OF ARC-JET PROPULSION DEVICES FINAL REPORT, 20 NOV. 1964 - 19 DEC. 1965.
by R. J. Checkley, W. G. Duke, D. W. Esker, J. C. Kroutil, and S. E. Merrifield. Mar 66, 112p NASA-CR-54691, E368
Contract NAS3-5758

Descriptors: Arc, *Arc jet, Constriction, Cooling, Electric, *Electric propulsion, Energy, *Energy transfer, Exhaust, Flow, Jet, Magnetohydrodynamic, Mechanism, Propulsion, *Propulsion system, Radiation, Regeneration, System, Transfer, Water.

For abstract, see S 04 14.

N66-34865 **Field 21C**
CFSTI Prices HC$1.00 MF$0.50
California Univ., Berkeley.
INVESTIGATION OF KILOVOLT ION SPUTTERING QUARTERLY PROGRESS REPORT, MAY - JUL. 1966.
by F. C. Hurlbut, N. T. Olson, T. H. Pigford, and H. P. Smith Jr. 31 Jul 66, 22p NASA-CR-54908
Contract NAS3-5743
Its Ser. No. 7, Issue 31

Descriptors: Activation, Aluminum, Analysis, Angular, Cesium, Counter, Density, Distribution, Electrode, Energy, Erosion, *Ion bombardment, Measurement, Mercury, Microprobe, Neutron, *Neutron activation, Noise, Oxygen, Rocket engine, *Sputtering, Surface, Velocity, X-ray.

For abstract, see S 04 20.

N66-35210 **Field 21C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
A 5-CENTIMETER-DIAMETER ELECTRON-BOMBARDMENT THRUSTOR WITH PERMANENT MAGNETS.
by J. F. Wasserbauer. Sep 66, 34p NASA-TN-D-3628
Contract 120-26-02-05-22

Descriptors: Attitude, Bombardment, Chamber, Control, Electric, Electromagnet, Electron, *Electron bombardment, Flow, Ion, *Ionic propulsion, Magnet, Performance, Permanent, Propellant, Propulsion, Rate, Satellite, *Satellite attitude control, Synchronous, *Thrustor.

For abstract, see S 04 20.

AD-639 302 **See Field 10C**

AD-639 609 **See Field 10C**

21D. FUELS

AD-639 349 **Field 21D, 7A, 8D**
Not available from CFSTI.
Utah Univ., Salt Lake City. Inst. for the Study of Rate Processes.
EXPERIMENTAL STUDY OF THE EFFECTS OF TEMPERATURE AND ULTRA-HIGH PRESSURE ON THE COALIFICATION OF BITUMINOUS COAL.
by Lin-Sen Pan, Terrell N. Andersen, and Henry Eyring. 20 Dec 65, 5p
Grant DA-ARO (D)-31-124-G18
AROD-2759:10
Availability: Published in I and EC Process Design and Development v5 n3 p242-6 Jul 1966.

Descriptors: (*Coal, Synthesis (Chemistry)), Organic materials, Heating, Temperature, Pressure, Molecular structure, X-ray spectroscopy, Infrared spectroscopy, Resistance (Electrical), Vaporization.

Artificial coalification of high volatile bituminous coal was experimentally effected by heating the coal (at temperatures up to 850C.) at pressures of 30 kilobars. Such samples were compared with coal heated at atmospheric pressure and also with standard coal samples of various ranks, by means of ultimate analysis, x-ray spectroscopy, IR spectroscopy, and electrical resistivity. The above tests indicate that heat breaks off fragments ('volatiles') of the coal structure, and drives them off as gases, while high pressure causes retention of many of these products through retardation of bond breakage or through reactions which condense them onto the coal structure. The structure of coal, subjected to elevated temperatures and pressures, tends toward that of higher rank coals, while the product of low pressure heating tends toward coke. (Author)

AD-639 063 **See Field 21B**

21E. JET AND GAS TURBINE ENGINES

AD-638 982 **Field 21E, 21B**
Not available from CFSTI.
Princeton Univ., N. J.
HIGH SPEED AERODYNAMICS AND JET PROPULSION. VOLUME II. COMBUSTION PROCESSES.
by B. Lewis, R. N. Pease, and H. S. Taylor. 1956, 662p
Contract Nonr-03201
Availability: Hard copy available from Princeton University Press, Princeton, N. J. $12.50.

Descriptors: (*Jet propulsion, Aerodynamics), (*Combustion, *Jet engines), Thermodynamics, Reaction kinetics, Flame propagation, Gases, Propellants, Nuclear energy.

The volume is concerned with combustion processes in their various aspects, encompassing chemical kinetics, the kinetics of transport processes, fluid dynamics, and thermodynamics. It deals, therefore, with rate processes in chemical reactions, with the propagation of chemical reaction by the mechanisms of combustion waves, with the effect of turbulence on combustion waves, with processes of simultaneous mixing and combustion of fuels and oxidants, and with chemical equilibria. These subjects are basic for an understanding of the role of combustion in propulsion processes. After a survey of basic principles the presentation continues with oxidation and flame propagation in gaseous systems, and the combustion of liquid and solid fuels and propellants. Final sections of the book are devoted to detonation processes and the principles of energy production by nuclear reaction.

AD-638 983 **Field 21E, 20D, 20M**
Not available from CFSTI.
Princeton Univ., N. J.
HIGH SPEED AERODYNAMICS AND JET PROPULSION. VOLUME V. TURBULENT FLOWS AND HEAT TRANSFER.
by C. C. Lin. 1959, 563p
Contract Nonr-03201
See also AD-638 982.
Availability: Hard copy available from Princeton University Press, Princeton, N. J. $15.00.

Descriptors: (*Jet propulsion, Aerodynamics), (*Heat transfer, Fluid flow), (*Turbulence, Fluid flow), Laminar flow, Gas flow, Friction.

The volume deals with the interrelated problems of turbulent flow and heat transfer. It begins with an article on transition from laminar to turbulent flow. This is followed by a discussion of the problem of shear flow from the experimental and semi-empirical points of view and of the statistical theory of turbulence from a deductive point of view. The three modes of heat transfer--conduction, convection, and radiation--are presented in the remaining part of the volume. These articles are especially oriented toward high speed flows with high temperature differences. Free convection due to gravitational forces is considered in this portion of the volume only in connection with boiling heat transfer.

AD-638 984 **Field 21E, 20D, 1A**
Not available from CFSTI.
Princeton Univ., N. J.

HIGH SPEED AERODYNAMICS AND JET PROPULSION. VOLUME VI. GENERAL THEORY OF HIGH SPEED AERODYNAMICS.
by W. R. Sears. 1954, 773p
Contract Nonr-03201
See also AD-638 983.
Availability: Hard copy available from Princeton University Press, Princeton, N. J. $20.00.

Descriptors: (*Jet propulsion, *Aerodynamics), Theory, Gas flow, Perturbation theory, Supersonic flow, Mathematical analysis, Transonic flow, Shock waves, Aircraft.

The volume summarizes present-day knowledge in the theory of high speed aerodynamics. It begins with an over-all sketch of the subject by Theodore von Karman. K. O. Friedrichs presents a new study of the mathematical nature of hyperbolic flows, i.e. supersonic or unsteady compressible flows. Attention is then directed especially toward the theories based on the small disturbance hypothesis. W. R. Sears presents and summarizes subsonic small perturbation theory, with emphasis on recent studies that unify and clarify this subject, and on rotational and unsteady flows. The largest section of the volume is by Max..A. Heaslet and Harvard Lomax, who present in a unified manner the whole subject of linearized supersonic theory, especially with application to wings. Their section also includes the transonic and hypersonic nonlinear approximations. M. J. Lighthill's contribution concerns the methods of higher approximation which are used to improve the first order theories and to explain and eliminate their shortcomings. Y. H. Kuo and W. R. Sears collaborate in a section presenting a review of a highly complicated and confused subject: the theory of potential subsonic and mixed supersonic-subsonic plane flows based on the hodograph method. Antonio Ferri writes on the method of characteristics applied to steady two- and three-dimensional flows and flow patterns characterized by the presence of shock waves.

AD-638 985 **Field 21E, 20D, 1A**
Not available from CFSTI.
Princeton Univ., N. J.
HIGH SPEED AERODYNAMICS AND JET PROPULSION. VOLUME VII. AERODYNAMIC COMPONENTS OF AIRCRAFT AT HIGH SPEEDS.
by A. F. Donovan, and H. R. Lawrence. 1957, 855p
Contract Nonr-03201
See also AD-638 984.
Availability: Hard copy available from Princeton Univ. Press, Princeton, N. J.

Descriptors: (*Jet propulsion, Aerodynamics), (*Aerodynamic characteristics, *Aircraft), Wings, Interference, Propellers (Aerial), Diffusers, Nozzles, Airframes.

Size limits the volume primarily to aircraft components, i.e. wings (in both steady and nonsteady motion), bodies, interference effects, propellers, diffusers, and nozzles. Items dealing with the aircraft as a whole, such as performance, aeroelasticity, and stability and control, are found in Volume VIII. The volume begins with a comprehensive treatment of the steady state aerodynamic theory of wings by R. T. Jones and Doris Cohen. The tables of flow functions in this section should be particularly useful to the practicing aerodynamicist. Clinton Brown next presents a section on the aerodynamics of bodies at high speed, which is noteworthy for including bodies of noncircular cross section--a type which is usually given too little attention. Interactions between wings, body, tail, and propeller are treated in a section by C. Ferrari, who was aided in translation by R. Cramer. This section is notable for bringing together much information which otherwise can only be found scattered widely through the literature. Propellers at high speeds, including supersonic propellers, are covered in a section by C. B. Smith. A section on diffusers and nozzles by J. C. Evvard completes the treatment of the external aerodynamics of high speed propulsion systems. The basis for the treatment of aeroelastic problems is presented in a section by I. E. Garrick on nonsteady wing characteristics. A section by C. W. Frick on the experimental aerodynamics of wings clearly brings out the accomplishments of aerodynamic theory and the limitations imposed by assumptions. (Author)

AD-638 986 **Field 21E, 1A, 1C**
Not available from CFSTI.
Princeton Univ., N. J.
HIGH SPEED AERODYNAMICS AND JET PROPULSION. VOLUME VIII. HIGH SPEED PROBLEMS OF AIRCRAFT AND EXPERIMENTAL METHODS.
by A. F. Donovan, H. R. Lawrence, F. E. Goddard, and R. R. Gilruth. 1961, 1013p
Contract Nonr-03201
See also AD-638 985.
Availability: Hard copy available from Princeton University Press, Princeton, N. J. $22.50.

Descriptors: (*Jet propulsion, *Aerodynamics), (*Aircraft, Performance (Engineering)), Design, Stability, Aeroelasticity, Wind tunnels, Shock tubes, Tests, Test facilities, Flutter.

The first portion of the volume is concerned with aircraft design problems that are particularly associated with high speeds. An introductory discussion of the type of performance calculation peculiar to high speed aircraft is followed by a section devoted to the problems of stability and control at high speeds. The final section of this portion is a rather complete treatise on the problems of aeroelasticity which are encountered with high speed aircraft. The second portion of the volume is concerned with the techniques of aerodynamic testing in wind tunnels and shock tubes. Consideration is given not only to testing techniques in the three speed ranges--transonic, supersonic, and hypersonic--but also to facilities for testing in the regime of rarified gas dynamics. The final portion of the volume is devoted to a discussion of free flight test techniques. A discussion of the basic techniques of instrumented rocketry is followed by a section on the testing of piloted aircraft. The final section is a treatise on free flight range techniques.

AD-638 987 **Field 21E, 20D, 21B**
Not available from CFSTI.
Princeton Univ., N. J.
HIGH SPEED AERODYNAMICS AND JET PROPULSION. VOLUME IX. PHYSICAL MEASUREMENTS IN GAS DYNAMICS AND COMBUSTION.
by R. W. Ladenburg, B. Lewis, R. N. Pease, and H. S. Taylor. 1954, 588p
Contract Nonr-03201
See also AD-638 986.
Availability: Hard copy available from Princeton University Press, Princeton, N. J. $15.00.

Descriptors: (*Jet propulsion, Aerodynamics), (*Aerodynamics, Measurement), (*Combustion, Measurement), Gas flow, Physical properties, Density, Pressure, Velocity, Temperature, Shock waves, Turbulence, Condensation, Flames, Spectroscopy, Instrumentation.

The volume is concerned with physical measurements in gas dynamics and with the corresponding measurements in combustion processes. It records the varying techniques which can be employed to measure density, pressure, velocity, and temperature in gaseous systems. It deals with the measurements of shock waves, turbulence, condensation studies, and analogue methods. The second half of the volume is concerned with techniques and the measurement of properties in materials undergoing combustion processes.

AD-638 988 **Field 21E, 21B**
Not available from CFSTI.
Princeton Univ., N. J.
HIGH SPEED AERODYNAMICS AND JET PROPULSION. VOLUME XI. DESIGN AND PERFORMANCE OF GAS TURBINE POWER PLANTS.
by W. R. Hawthorne, and W. T. Olson. 1960, 571p
Contract Nonr-03201
See also AD-638 987.
Availability: Hard copy available from Princeton University Press, Princeton, N. J. $15.00.

Descriptors: (*Jet propulsion, Aerodynamics), (*Gas turbines, *Aircraft engines), Compressors, Combustion chambers, Combustion, Mechanical properties, Metals, Performance (Engineering).

This volume, XI, and its companion piece, Volume X, comprise a treatment of the aircraft gas turbine power plant. In particular, the two volumes discuss the major engine components--compressor, combustor, turbine, and controls--with a view toward describing, explaining, and interpreting the basic phenomena influencing their design and operation. The main subjects in Volume XI are combustion, mechanical and metallurgical aspects, and performance and control.

AD-638 989 **Field 21E**
Not available from CFSTI.
Princeton Univ., N. J.
HIGH SPEED AERODYNAMICS AND JET PROPULSION. VOLUME XII. JET PROPULSION ENGINES.
by O. E. Lancaster. 1959, 821p
Contract Nonr-03201
See also AD-638 988.
Availability: Hard copy available from Princeton Univ. Press, Princeton, N. J. $20.00.

Descriptors: (*Jet propulsion, Aerodynamics), (*Jet engines, Scientific research), (*Aircraft engines, Jet engines), Turbojet engines, Turboprop engines, Ramjet engines, Pulsejet engines, Rocket motors, Nuclear propulsion, Construction.

The volume considers those principles and problems encountered in combining components to form a complete engine.

N66-26775 **Field 21E**
CFSTI Prices HC$2.00 MF$0.50
France. Office National D Etudes Et De Recherches Aerospatiales, Chatillon-sous-bagneux.
DESIGN AND FLIGHT TESTS OF A MACH-5 EXPERIMENTAL RAMJET.
Etude Et Essais En Vol D'un Statoreacteur Experimental A Mach 5
by R. Marguet. 1966, 37p TN-94/1966/
In French, English Summary

Descriptors: Atmospheric, Booster, *Flight test, *Mach number, Missile, Propulsion, *Propulsion system, Ramjet, *Ramjet missile, Rocket, Supersonic, System, Trajectory, Unmanned, Velocity.

For abstract, see S 04 14.

PB-170 855 **See Field 14B**

21F. NUCLEAR PROPULSION

N66-25573 **Field 21F**
CFSTI Prices HC$7.06 MF$2.00
General Dynamics Corp., San Diego, Calif.
TUNGSTEN NUCLEAR ROCKET, PHASE I, PART I FINAL REPORT.
by R. G. Bardes, S. C. Cohen, S. J. Friesenhahn, E. M. Gillette, and E. Haddad. 22 Apr 66, 406p
NASA-CR-54909, GA-6890
Contract SNPC-27

Descriptors: Analysis, Beryllium, Cell, Configuration, Core, Experiment, Measurement, Moderation, Moderator, Nuclear, *Nuclear rocket, Reactor, Reflector, Resonance, Rock-

et, Structure, *Tungsten, Water, *Water moderated reactor.

For abstract, see S 04 14.

N66-26757 Field 21F
CFSTI Prices HC$4.00 MF$1.00
Aerojet-general Corp., Sacramento, Calif.
CENTERBODY DIFFUSER STUDY.
Oct 65, 124p NASA-CR-75221, RN-S-0243
Contract SNP-1

Descriptors: Aerodynamics, Centerbody, *Diffuser, Diffusion, Fission, *Fission product, Gaseous, *Gaseous diffusion, Model, Nuclear, *Nuclear rocket, Product, Rocket, Scale, *Scale model, Supersonic, *Supersonic diffuser, Testing, Thermal, *Thermal diffusion, Thermodynamics.

For abstract, see S 04 14.

N66-35211 Field 21F
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYSIS OF THE TRANSIENT FLOW OF HYDROGEN IN HEATED PASSAGES IN THE LAMINAR-TURBULENT TRANSITION REGION.
by R. W. Leko. Sep 66, 24p NASA-TN-D-3629
Contract 121-30-02-03-22

Descriptors: Analysis, Circular, Core, Drop, Flow, *Flow stability, Flux, Heat, Hydrogen, Inlet, Laminar, *Laminar flow, Nuclear, Outlet, Perturbation, *Pipeflow, Point, Pressure, Reactor, Rocket, Stability, State, Steady, Transient, Transition, *Transition point, Tube, Turbulent, *Turbulent flow.

For abstract, see S 04 20.

N66-35222 Field 21F
CFSTI Prices HC$3.00 MF$0.75
General Dynamics Corp., San Diego, Calif.
TUNGSTEN NUCLEAR ROCKET, PHASE II, PART 1 FINAL REPORT, JAN. 16 - JUN. 15, 1966.
by R. G. Bardes, C. F. Bohren, S. C. Cohen, and J. C. Peak. 15 Jun 66, 101p NASA-CR-54986, GA-7190
Contract SNPC-27

Descriptors: Activation, Analysis, Calculation, Coefficient, Core, Critical, Distribution, Eigenvalue, Experiment, Fraction, Lifetime, Loading, Measurement, Moderation, Neutron, Nuclear, *Nuclear rocket, Power, Pulse, Reactivity, Reactor, Rocket, Temperature, *Tungsten, Water, *Water moderated reactor.

For abstract, see S 04 20.

21G. RECIPROCATING ENGINES

N66-25497 Field 21G
CFSTI Prices HC$1.00 MF$0.50
Metaalinstituut Tno, Delft (Netherlands).
RESEARCH ON A BROKEN DRIVESHAFT.
Onderzoek Van Een Gebroken Hoofddrivfstang
by W. Hagg. 31 Jan 66, 13p M-66-91, TDCK-44577
In Dutch

Descriptors: Crack, Drive, *Electron microscopy, Engine, *Engine testing, Engineering, Fatigue, *Fatigue test, Mechanical, *Metal, Reliability, *Shaft, Stress, Testing.

For abstract, see S 04 14.

AD-639 154 See Field 21B

21H. ROCKET MOTORS AND ENGINES

N66-24537 Field 21H
CFSTI Prices HC$6.00 MF$1.25
Aerojet-general Corp., Sacramento, Calif.
260-IN.-DIA MOTOR FEASIBILITY DEMONSTRATION PROGRAM. VOLUME IV - 260-SL MOTOR INTERNAL INSULATION SYSTEM.
8 Apr 66, 212p NASA-CR-54930, FPR-4
Contract NAS3-6284

Descriptors: Acrylonitrile, Asbestos, Butadiene, Characteristics, Design, Engine, Fabrication, Fiber, Firing, *Insulation, Material, *Material testing, Performance, *Performance characteristics, Propellant, Rocket, Rubber, Solid, *Solid propellant rocket engine, Subscale, System, Test, *Test firing, Testing.

For abstract, see S 04 13.

N66-24587 Field 21H
CFSTI Prices HC$4.00 MF$0.75
Martin Co., Denver, Colo.
ACOUSTIC SCALE-MODEL TESTS OF HIGH-SPEED FLOWS FINAL REPORT.
by E. B. Smith. Mar 66, 104p NASA-CR-74596, CR-66-13
Contract NAS8-20223

Descriptors: *Acoustics, Chamber, *Chamber pressure, Cluster, Field, Flow, Fuel, Generation, High speed, Hydrogen, *Hydrogen fuel, Measurement, Model, Pressure, Propulsion, *Rocket engine, Saturn, Scale, *Scale model, System.

For abstract, see S 04 13.

N66-25002 Field 21H
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF ROCKET NOZZLE MATERIALS WITH SEVERAL SOLID PROPELLANTS.
by J. C. Freche, J. R. Johnston, and R. A. Signorelli. May 66, 36p NASA-TN-D-3428

Descriptors: Carbide, Ceramic, Cermet, Cracking, Erosion, Graphite, Metal, Nozzle, Propellant, Refractory, *Refractory metal, Rocket, Rocket engine, *Rocket nozzle, Solid, *Solid propellant, Stress, Thermal, *Thermal stress, Throat.

For abstract, see S 04 13.

N66-25435 Field 21H, 22B
CFSTI Prices HC$3.00 MF$0.50
France. Office National D Etudes Et De Recherches Aerospatiales, Chatillon-sous-bagneux.
SMALL HYBRID ROCKET PROBES FOLLOWING AN OPTIMUM OR QUASI-OPTIMUM TRAJECTORY.
Petites Fusees Sondes A Lithergol, A Trajectoires Optimales Et Quasi-optimales
by P. Duban. 1965, 54p TN-1965-86
In French, English Summary

Descriptors: Atmospheric, Cost, Design, Hybrid, *Hybrid rocket, *Mathematical model, Mathematics, Meteorology, Model, Propulsion, Reliability, Rocket, Sounding, *Sounding rocket, System.

For abstract, see S 04 14.

N66-25585 Field 21H
CFSTI Prices HC$3.00 MF$0.75
Aerojet-general Corp., Sacramento, Calif.
SUMMARY OF OBSERVED RESULTS WHEN CHILLING THE M-1 FUEL TURBOPUMP TO LIQUID HYDROGEN TEMPERATURE.
by J. A. Ritter. 3 Jun 66, 80p NASA-CR-54828, AGC-8800-65
Contract NAS3-2555

Descriptors: Bearing, Chill, *Cooling, Cryogenic, Cryogenics, Fuel, Hydrogen, Instrumentation, Insulation, Liquid, *Liquid hydrogen, *M- 1 rocket engine, Rocket engine, Turbine, *Turbopump.

For abstract, see S 04 14.

N66-26283 Field 21H
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
THE EFFECT OF INJECTOR DESIGN ON THRUST- CHAMBER EROSION.
by R. W. Rowley, and W. H. Tyler. 1 Mar 66, 25p NASA-CR-75153, JPL-TR-32-750
Contract NAS7-100

Descriptors: Ablation, Chamber, Combustion, *Combustion chamber, Erosion, Graphite, *Injector, Orifice, Pyrolysis, *Pyrolytic graphite, Spray, *Throat, Thrust.

For abstract, see S 04 14.

N66-26655 Field 21H
CFSTI Prices HC$2.00 MF$0.50
Catholic Univ. Of America, Washington, D. C.
DYNAMICS OF SOLID PROPELLANT ROCKET MOTORS FINAL REPORT.
Apr 66, 32p NASA-CR-75120
Grant NSG-125-61

Descriptors: Abstract, Apparatus, Complex, Dynamics, Eigenvalue, Geometry, Grain, Linear, Material, *Mathematical model, Mathematics, Measuring, *Measuring apparatus, Model, Modulus, Propellant, Rocket engine, Shear, Solid, *Solid propellant, Vibration, Viscoelasticity.

For abstract, see S 04 14.

N66-26756 Field 21H
CFSTI Prices HC$1.00 MF$0.50
Aerojet-general Corp., Sacramento, Calif.
LITTLE JOE II PROGRAM - MONTE CARLO STUDY OF MOTOR PERFORMANCE.
1966, 17p NASA-CR-75212
Contract NAS9-456

Descriptors: *Algol rocket engine, Ballistics, Burning, Effect, Launch vehicle, *Little joe ii launch vehicle, Method, *Monte carlo method, Performance, *Performance orediction, Prediction, Propellant, Property, Rate, Rocket engine, Solid, *Solid propellant rocket engine, Statistical, Variation.

For abstract, see S 04 14.

N66-26762 Field 21H
CFSTI Prices KC$4.00 MF$1.00
Aerojet-general Corp., Sacramento, Calif.
LITTLE JOE II MOTOR DEVELOPMENT PROGRAM FINAL REPORT.
25 Oct 63, 131p NASA-CR-75263
Contract NAS9-456
Its Rept.-0667-01f

Descriptors: *Algol rocket engine, Control, Destruction, Equipment, Ground, *Ground support equipment, Igniter, Launch vehicle, *Little joe ii launch vehicle, Motor, Nozzle, Reliability, Rocket engine, Support, Test.

For abstract, see S 04 14.

N66-26764 Field 21H
CFSTI Prices HC$3.00 MF$0.75
Aerojet-general Corp., Sacramento, Calif. General Dynamics/convair, San Diego, Calif.
LITTLE JOE II - ALGOL PROPULSION SYSTEM TECHNICAL INTERFACE CONTROL DOCUMENT.
1 Jul 63, 80p NASA-CR-75262
Contracts NAS9-452, NAS9-456

Prepared Jointly With General Dynamics Its Rept.-0667-ticd-1

Descriptors: Algol, *Algol rocket engine, Component, Drawing, Equipment, *Equipment specifications, Interface, Launch vehicle, *Little joe ii launch vehicle, Mechanical, Propulsion, *Propulsion system, Rocket engine, Specification, System.

For abstract, see S 04 14.

N66-35306 **Field 21H**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE "DELTA P" APPROACH FROM NIKE COMBUSTION INSTABILITY.
by A. Hisler. 4 Oct 65, 8p NASA-TM-X-56943
Presented At The 2d Icrpg Combust. Instability Conf., El Segundo, Calif., 1-5 Nov. 1965 Submitted For Publication

Descriptors: Combustion, *Combustion instability, Engine, Enthalpy, Flow, Gas, Heat, Instability, Liquid, *Liquid propellant rocket engine, Nozzle, Propellant, Reduction, Rocket, Solid, *Solid propellant rocket engine, Stagnation, *Stagnation flow, Swirl.

For abstract, see S 04 20.

AD-638 993 **See Field 21B**

AD-639 063 **See Field 21B**

PB-170 858 **See Field 21B**

21I. ROCKET PROPELLANTS

AD-639 021 **Field 21I, 21B**
Not available from CFSTI.
Stanford Research Inst., Menlo Park, Calif.
PROPELLANT DEFLAGRATION CONTROL: A METHOD FOR SUPPRESSING UNSTABLE COMBUSTION.
by Lionel A. Dickinson, Erwin L. Capener, and Roger J. Kier. 1966, 10p
Contract AF 49 (638)-565
Proj. 3814-7
AFOSR-66-1705
Research supported in part by ARPA.
Availability: Published in Chemical Engineering Progress Symposium Series v62 n61 p63-9 1966.

Descriptors: (*Solid rocket propellants, Deflagration), (*Deflagration, Control), (*Combustion, Propellant grains), Stabilization, Composite propellants, Fluid dynamic properties, Chemical reactions.

Because certain correlations between propellant and instability were observed, it is argued that the instability might be controlled by reactions occurring at or near the burning surface. Results of experimental studies suggested by this hypothesis indicate that this control is an effective way of precluding a regenerative interaction between a fluid dynamic disturbance and the propellant combustion reaction. (Author)

AD-639 222 **Field 21I, 20L**
CFSTI Prices: HC$1.00 MF$0.50
Stanford Research Inst., Menlo Park, Calif.
ELECTRICAL CONDUCTIVITY OF SOLID AMMONIUM PERCHLORATE.
Interim rept.
by Henry Wise. 1966, 15p
Contract Nonr-3415 (00)
Proj. NR-092-507

Descriptors: (*Ammonium compounds, *Perchlorates), (*Solid rocket oxidizers, Electrical conductance), Temperature, Ionic current, Crystal lattice defects, Heat of formation, Enthalpy, Single crystals.

Identifiers: Ammonium perchlorate.

The electrical conductivity of solid ammonium perchlorate was measured over a temperature range from 500 K to 600 K. From the variation of the ionic conductivity in an applied electric field as a function of temperature, the enthalpy of formation of lattice defects is found to be 24 kcal and the energy barrier for lattice-defect migration, 20 kcal. The relatively high electrical conductivity of ammonium perchlorate compared with alkali halides and the marked influence of gaseous ammonia on the conductivity are interpreted in terms of a mechanism of charge transfer by proton jump. (Author)

N66-34652 **Field 21I**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPARISON OF EXPERIMENTAL AND KINETICALLY LIMITED THEORETICAL PERFORMANCE OF THE HYDROGEN-FLUORINE PROPELLANT SYSTEM.
by D. A. Bittker. Aug 66, 19p NASA-TN-D-3607
Contract 129-01-02-01-22

Descriptors: Calculation, Chamber, *Fluorine, Fuel, Hydrogen, *Hydrogen fuel, Kinetics, Model, Nozzle, Performance, Propellant, *Rocket engine, System, Theoretical.

For abstract, see S 04 20.

N66-34701 **Field 21I**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
REVIEW OF SOLID PROPELLANTS FOR SPACE EXPLORATION.
by F. J. Hendel. 1 Oct 65, 23p NASA-CR-77354, JPL-TM-33-254
Contract NAS7-100

Descriptors: Binder, Fuel, Impulse, Launch vehicle, Oxidizer, Propellant, Solid, *Solid propellant, *Space vehicle, Spacecraft, Specific.

For abstract, see S 04 20.

N66-34799 **Field 21I**
CFSTI Prices HC$4.00 MF$1.00
North American Aviation, Inc., Downey, Calif.
A STUDY OF PROPELLANT BEHAVIOR AT ZERO GRAVITY FINAL REPORT.
by E. T. Benedikt. 15 Apr 66, 120p NASA-CR-77358, SID-66-286
Contract NAS8-11097

Descriptors: Analysis, Boiling, Circular, Cylinder, Differential, Dissipation, Drop, Energy, Equation, Free, Gravity, Heat transfer, Interface, Kinetics, Liquid, *Liquid propellant, Motion, *Motion equation, Numerical, *Numerical analysis, Propellant, Surface, Tank, Tension, *Weightlessness, Zero.

For abstract, see S 04 20.

AD-639 200 **See Field 7A**

22A. ASTRONAUTICS

AD-639 059 **Field 22A, 14B, 6S**
CFSTI Prices: HC$1.00 MF$0.50
Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
A TECHNIQUE TO INVESTIGATE SPACE MAINTENANCE TASKS.
Joint NASA/USAF Study.
by Donald D. Mueller, Jerome S. Seeman, and Francis H. Smith. Apr 66, 16p AMRL-TR-66-32
Projs. AF-7184, NASA-T-18811-G
Task 718405

Prepared in cooperation with George C. Marshall Space Flight Center, National Aeronautics and Space Administration, Huntsville, Ala.

Descriptors: (*Space maintenance, Performance tests), Pressure suits, Performance (Human), Weightlessness, Psychomotor tests, Gravity (Artificial), Space simulation chambers, Test equipment, Test methods.

A series of preliminary studies was performed to determine if a high-fidelity ground-based simulation of zero gravity is necessary to obtain valid information about zero-G maintenance performance. Removal and replacement of a prestart solenoid valve on a rocket engine was selected as the basic maintenance task to be studied. Time scores for laboratory performance of the task were compared with scores obtained from subjects operating on the task during periods of transient weightlessness in a KC-135 aircraft. Modified hand tools, a tool box, and a worker tethering system were developed for use in the experiment. Major conclusions were (1) the factor contributing most to performance decrement in space maintenance was space suit pressurization level; (2) in this study, the effect of weightlessness on performance was less than the effect of suit pressure level, and, in this instance, it would not have been necessary to introduce zero-G conditions to conduct a meaningful study of space maintenance performance. (Author)

AD-639 378 **Field 22A, 4A, 3B, 22B K**
CFSTI Prices: HC$6.00 MF$1.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
COSMIC RESEARCH. VOLUME 4, NO. 1, 1966.
23 Jun 66, 295p FTD-TT-66-76
TT-66-62322
Unedited rough draft trans. of Kosmicheskie Issledovaniya (USSR) v4 n1 175p 1966.

Descriptors: (*Astrophysics, USSR), (*Atmosphere, USSR), (*Space flight, USSR), Interplanetary trajectories, Transfer trajectories, Upper atmosphere, Meteors, Gas ionization, Photochemistry, Scientific satellites, Nuclear explosions, High altitude, Satellites (Artificial), Photoelectric cells (Semiconductor), Astronauts, Closed ecological systems, Manned spacecraft, Spores, Van Allen radiation belt, Cosmic rays, Space biology.

Identifiers: Antimatter.

Partial contents: Optimum distribution of correcting impulses in single-parameter correction; Energetically optimal transfers from a hyperbolic orbit; Optimum transfers between coplanar elliptical orbits; Two matrix forms of estimates of spacecraft motion parameters; Neutral composition of the atmosphere in the 100-200 km altitude region; Possible antimatter nature of micrometeors; Emission spectra of rarefied molecular gases excited by fast electrons; Photochemical equilibrium and ionic composition of the upper layers of the atmosphere; Investigation of the softest corpuscles with satellites; Registration of fragment gamma-radiation in the high-altitude explosion of 9 July 1962 over Johnston Island; Total quantity of neutral hydrogen in the Upper Atmosphere; Temperature field of thin-walled satellite surfaces in radiant heat transfer; Spectral and temperature characteristics of photoelectric transducers and ranges for their application; Certain dynamic characteristics of the operator in tracking under the conditions of spaceflight on the Voskhod 2 Craft; Endogenic formation of carbon monoxide in a closed ecological system; Preflight and postflight medical examination of crew members of the voskhod spacecraft; Factors in spaceflight on tradescantia paludosa microspores; Short communications.

AD-639 441 **Field 22A, 22B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
A NEW EPOCH IN PERCEPTION OF THE UNIVERSE.

by M. V. Keldysh, and A. I. Lebedinskii. 15 Jun 66, 10p FTD-HT-66-227
TT-66-62339
Unedited rough draft trans. of Pravda, Moscow (USSR), 11 Feb p1-3 1966.

Descriptors: (*Lunar probes, *Astronautics), Soft landings, Space flight, Moon, Telemetering data, Photographs, USSR.

A press conference on Luna 9 investigations and other space accomplishments is presented.

AD-639 495 **Field 22A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
TRUTH, JANUARY 1, 1966: SELECTED ARTICLES.
15 Jun 66, 12p FTD-HT-66-226
TT-66-62356
Unedited rough draft trans. from Pravda, Moscow (USSR), p4 1 Jan 1966.

Descriptors: (*Astronautics, USSR), Space flight, Venus probes.

AD-639 557 **Field 22A, 5D**
CFSTI Prices: HC$2.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
THE QUESTION OF SOURCES OF SPACE LAW.
by P. I. Lukin. 11 Aug 66, 29p FTD-HT-66-381
TT-66-62363
Edited trans. of mono. Voprosy Mezhdunarodnogo Prava, Moscow, 1963 p127-46.

Descriptors: (*Extraterrestrial bases, Law), (*Spacecraft, Law), (*Space navigation, Law), History, USSR.

N66-24396 **Field 22A**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DETERMINATION OF THE SPIN AXIS OF A SPINNING SATELLITE.
by F. O. Vonbun. 3 Jul 65, 22p NASA-TM-X-55452, X-507-66-31

Descriptors: Axis, Data, Determination, Dynamics, Ground, *Ground trach, Malfunction, Onboard, Rotation, Satellite, *Satellite rotation, Sensor, Spacecraft, Spin, *Spin dynamics, Stabilization, Track, Vector.

For abstract, see S 04 13.

N66-24514 **Field 22A**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SPACE PROGRAMS SUMMARY NO. 37-38, VOLUME VI FOR THE PERIOD JANUARY 1, 1966 TO FEBRUARY 28, 1966. SPACE EXPLORATION PROGRAMS AND SPACE SCIENCES.
31 Mar 66, 28p NASA-CR-74652, JPL-SPS-37-38, VOL. VI
Contract NAS7-100

Descriptors: Communication, Deep, *Mariner program, Network, Program, Space, *Space program, Spacecraft, *Surveyor project, *Voyager project.

For abstract, see S 04 13.

N66-24596 **Field 22A**
CFSTI Prices HC$1.00 MF$0.50
Douglas Aircraft Co., Inc., Santa Monica, Calif.
EXPERIMENTAL INVESTIGATION OF ULTRA-HIGH VACUUM ADHESION AS RELATED TO THE LUNAR SURFACE SEVENTH QUARTERLY PROGRESS REPORT, 1 JAN. - 31 MAR. 1966.
by J. A. Ryan. 26 Jun 64, 24p NASA-CR-74625
Contract NAS7-307

Descriptors: *Adhesion, Alloy, Aluminum, Behavior, *Friction, Lunar, *Lunar surface, Magnesium, Metal, Nickel, *Silicate, Surface, Ultrahigh, *Ultrahigh vacuum, Vacuum.

For abstract, see S 04 13.

N66-25046 **Field 22A**
CFSTI Prices HC$5.00 MF$1.25
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
RANGER VIII AND IX. PART II - EXPERIMENTERS, ANALYSES AND INTERPRETATIONS.
by R. L. Heacock, G. P. Kuiper, E. M. Shoemaker, H. C. Urey, and E. A. Whitaker. 15 Mar 66, 182p NASA-CR-74894, JPL-TR-32-800
Contract NAS7-100

Descriptors: Crater, Geology, Interpretation, Lunar, *Lunar photography, Mare, Moon, Photogrammetry, Photograph, *Photograph interpretation, Photography, Probe, *Ranger block iii, Ranger lunar probe, Selenography, Selenology, Surface.

For abstract, see S 04 13.

N66-25065 **Field 22A**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
A STUDY OF THE PROBABILITY OF DEPOSITING VIABLE ORGANISMS ON MARS DURING THE MARINER 1964 MISSION.
by H. J. Gordon, and N. R. Haynes. 23 Oct 64, 15p NASA-CR-74629, JPL-TM-33-194
Contract NAS7-100

Descriptors: Contamination, Deposition, *Mariner space probe, Mariner spacecraft, Mars, *Mars (planet), Organism, Planet, Probe, Space, *Viability.

For abstract, see S 04 13.

N66-25545 **Field 22A**
CFSTI Prices HC$1.00 MF$0.50
Consultants And Designers, Inc., Arlington, Va.
LUNA-10 IN ORBIT AROUND THE MOON.
Luna-10 Na Orbite Vokrug Luny
11 Apr 66, 13p NASA-CR-74916, ST-PR-LPS-10472
Contract NAS5-9299
Transl. Into English From Pravda (Moscow), No. 95, 5 Apr. 1966

Descriptors: Artificial, Characteristics, Field, Flight, *Flight characteristics, Gravity, Lunar, *Lunar satellite, Magnetic, Meteor, Moon, Orbit, Performance, Radiation, Satellite, *Satellite orbit, Selenocentric, Temperature, Thermal, U.s.s.r..

For abstract, see S 04 14.

N66-25575 **Field 22A**
CFSTI Prices HC$3.00 MF$0.75
Grumman Aircraft Engineering Corp., Bethpage, N.Y.
INVESTIGATION OF LUNAR SURFACE CHEMICAL CONTAMINATION BY LEM DESCENT ENGINE AND ASSOCIATED EQUIPMENT.
by L. Aronowitz, C. Baulknight, A. Buchler, F. Koch, and T. Luzzi. Jan 66, 64p NASA-CR-65342, RE-237
Contract NAS9-4860

Descriptors: Analysis, *Apollo project, Atmosphere, *Contamination, Distribution, Excursion, Exhaust, Inorganic, Lunar, *Lunar excursion module (lem), *Lunar surface, Material, *Microbiology, Model, Module, Organic, Plume, Rocket, Surface.

For abstract, see S.04 14.

N66-25576 **Field 22A**
CFSTI Prices HC$6.00 MF$1.25
Grumman Aircraft Engineering Corp., Bethpage, N. Y.
INVESTIGATION OF LUNAR SURFACE CHEMICAL CONTAMINATION BY LEM DESCENT ENGINE AND ASSOCIATED EQUPMENT FINAL REPORT.
by L. Aronowitz, C. Baulknight, J. Berkowitz-mattuck, A. Buchler, and P. Glaser. Mar 66, 215p NASA-CR-65341, RE-242
Contract NAS9-4860

Descriptors: *Apollo project, *Contamination, Device, Excursion, Inorganic, Instrument, Lunar, *Lunar excursion module (lem), *Lunar surface, Method, Microbiology, Module, Organic, Probe, Sample, Sampling, *Sampling device, Surface.

For abstract, see S 04 14.

N66-26147 **Field 22A**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
VISCOUS DAMPING OF ROLL DURING ENTRY OF A MARS ENTRY AND LANDING CAPSULE.
by J. E. Marte. 1 Apr 65, 15p NASA-CR-74887, JPL-TM-33-201
Contract NAS7-100

Descriptors: Blunt, *Blunt body, Body, Capsule, Cone, Damping, Disk, Entry, Flat, *Forebody, Hemisphere, Planetary, Rate, Roll, Rotating, *Rotating disk, Viscous, *Viscous damping.

For abstract, see S 04 14.

N66-26256 **Field 22A**
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
VOYAGER PROJECT PROGRESS REPORT, MAR. 16 - APR. 15, 1966.
1 May 66, 46p NASA-CR-75023, VPPR-15

Descriptors: Attitude, Breadboard, Capsule, Control, Design, Guidance, Power, Sensor, Space, *Space capsule, Spacecraft, *Spacecraft design, Supply, System, *Systems design, Telecommunication, *Voyager project.

For abstract, see S 04 14.

N66-26847 **Field 22A**
CFSTI Prices HC$7.00 MF$1.75
Boeing Co., Seattle, Wash.
A SYSTEM STUDY OF A MANNED ORBITAL TELESCOPE - SYNCHRONOUS ORBIT STUDY.
Apr 66, 316p NASA-CR-66102, D2-84042-2
Contract NAS1-3968

Descriptors: Configuration, Control, Cost, Distortion, Feasibility, Inclination, Laboratory, Logistics, Manned, *Manned orbital research laboratory (morl), Micrometeoroid, Observation, Orbit, Orbital, Radiation, Research, Stability, *Synchronization, *Telescope, Thermal.

For abstract, see S 04 14.

N66-26882 **Field 22A**
CFSTI Prices HC$4.00 MF$0.75
Little (Arthur D.), Inc., Cambridge, Mass.
STUDY OF CRYOGENIC STORAGE ON THE MOON.
by F. Gabron, P. E. Glaser, C. H. Sox, and P. F. Strong. Dec 65, 114p NASA-CR-75267
Contract NAS8-11377
Its Rept.-66563

Descriptors: Cryogenic, *Cryogenic storage, Environment, Exchange, Flux, Heat, Insulation, Lunar, *Lunar environment, Pipe, Radi-

ation, Solar, Storage, *Storage tank, Support, Surface, Tank.

For abstract, see S 04 14.

N66-34798 **Field 22A**
CFSTI Prices HC$1.00 MF$0.50
Stanford Univ., Calif.
BASIC STUDIES IN SPACE VEHICLE ATTITUDE CONTROL TENTH SEMIANNUAL STATUS REPORT, PERIOD ENDING JUN. 1966.
by R. H. Cannon Jr. and I. Flugge-lotz. 1966, 17p NASA-CR-77363
Grant NSG-133-61

Descriptors: Attitude, *Attitude control, Control, Ellipticity, Nonlinear, Optimal, *Optimal control, Orbit, Planet, Point, Satellite, *Satellite orbit, Space vehicle, *Space vehicle control, Theory.

For abstract, see S 04 20.

N66-34992 **Field 22A**
CFSTI Prices HC$2.00 MF$0.50
Douglas Aircraft Co., Inc., Santa Monica, Calif.
THE TIME-HISTORY OF A SATELLITE AROUND AN OBLATE PLANET.
by M. C. Eckstein, J. Kevorkian, and Y. Y. Shi. Feb 65, 39p NASA-CR-67862, DOUGLAS PAPER-3529
Contract NASW-901

Descriptors: Differential, Equation, Factor, Flight, *Flight mechanics, History, Mechanics, Motion, Oblateness, Orbit, Orbital, *Orbital motion, Planet, Quadrature, Satellite, *Satellite orbit, Time, *Time factor.

For abstract, see S 04 20.

N66-35015 **Field 22A**
CFSTI Prices HC$2.00 MF$0.50
Arizona State Univ., Tempe.
ATTITUDE STABILITY OF A SPINNING PASSIVE SATELLITE IN A CIRCULAR ORBIT SEMIANNUAL TECHNICAL PROGRESS REPORT, DEC. 1, 1965 - MAY 31, 1966.
by L. Meirovitch. 31 May 66, 37p NASA-CR-77400
Contract NGR-03-001-014

Descriptors: *Attitude, Circular, *Circular orbit, Floquet theory, Inertia, Liapunov function, Location, Orbit, Passive, *Passive satellite, Satellite, Spin, Stability, Torque, Width.

For abstract, see S 04 20.

N66-35221 **Field 22A**
CFSTI Prices HC$3.00 MF$1.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AERO-ASTRODYNAMICS RESEARCH REVIEW NO. 4, JULY 1 - DECEMBER 31, 1965.
by W. D. Murphree. 1 Apr 66, 130p NASA-TM-X-53462

Descriptors: Aerospace, *Aerothermodynamics, Dynamics, Environment, Flight, Fluid, *Fluid mechanics, *Instrumentation, Mechanics, Orbit, Prediction, Pressure, Propellant, Radiation, Remote, Review, Selenography, Sensing, Space, *Space environment, Structural, *Structural dynamics, Theory, Thermodynamics.

For abstract, see S 04 20.

N66-35314 **Field 22A**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GO, NO-GO FOR THE APOLLO SPACECRAFT - AN ANALYTICAL SOLUTION.
by F. O. Vonbun. 1965, 17p NASA-TM-X-56989
Submitted For Publication

Descriptors: Analysis, *Apollo spacecraft, Calculus, Computer, *Computer program, Earth, *Earth orbit, Error, Height, Inclination, Insertion, Lifetime, Orbit, Parking, *Parking orbit, Perigee, Program, Spacecraft, Variation, *Variational calculus.

For abstract, see S 04 20.

AD-638 881 **See Field 22B**

AD-638 916 **See Field 22B**

22B. SPACECRAFT

AD-638 705 **Field 22B, 20K**
Not available from CFSTI.
Giannini Controls Corp., Malvern, Pa.
EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF ELASTICITY ON THE STABILITY OF MANNED ROTATING SPACE STATIONS.
Revised ed.
by Jacob M. Miller. 21 Feb 66, 5p
Contract AF 49 (638)-1015
Proj. AF-9782
Task 978201
AFOSR-66-1641
Revision of manuscript submitted 21 Jul 65. Prepared for presentation at the AAIA Annual Meeting (2nd), San Francisco, Calif., 26-29 Jul 65.
Availability: Published in Journal of Spacecraft and Rockets v3 n6 p943-5 Jun 1966.

Descriptors: (*Elasticity, Experimental data), (*Space stations, Structural properties), Manned, Stability.

An experimental investigation of the effects of elasticity on the stability of manned rotating space stations was conducted. The minor deviations between the results and the previously predicted analytic values are well within acceptable experimental error. The stability criterion was thus verified and designers may use it as a guide for stiffness requirements. The parameters involved are general for each configuration so that they may be applied easily. Knowledge of natural vibration modes and spin-up forces enables a structural analyst to determine whether or not his design will exhibit the instability reported by the author of this paper. (Author)

AD-638 734 **Field 22B**
CFSTI Prices: HC$1.00 MF$0.50
Massachusetts Inst. of Tech., Cambridge.
OPTIMAL CONTROL OF MANEUVER-INDUCED VIBRATION IN FLEXIBLE AERO AND SPACE VEHICLES.
by Dean Karnopp. May 66, 22p
Contract AF 49 (638)-1314
AFOSR-66-0708

Descriptors: (*Spacecraft, *Vibration), Control, Optimization, Aerospace craft, Flexible structures, Thrust, Maneuvering satellites.

Forces applied to a large, flexible aero or space vehicle in order to change the vehicle's attitude or position will in general also excite undesirable vibration. The added cost in terms of time, complexity of thrust pattern and fuel or total control effort required to effect a given maneuver when the unwanted vibration is suppressed is studied in this paper. Techniques for interpreting optimal solutions to these problems are given based on the use of multiple phase plane plots. (Author)

AD-638 876 **Field 22B**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
LUNA-9 AT THE EXHIBITION OF ECONOMIC ACHIEVEMENTS OF THE USSR.
by K. Tolkachev. 31 Aug 66, 5p FTD-HT-66-345
TT-66-62226
Unedited rough draft trans. from Pravda (USSR) 28 Mar p6 1966.

Descriptors: (*Spacecraft, USSR), Models (Simulations), Lunar probes, Display systems.

Identifiers: Luna-9.

AD-638 881 **Field 22B, 22A**
CFSTI Prices: HC$1.00 MF$0.50
Foreign Technology Div., Wright-Patterson AFB, Ohio.
TRACKING A SPACESHIP.
6 Apr 66, 24p FTD-TT-65-1706
TT-66-62231
Unedited rough draft trans. of Aero-Sport (East Germany) n9 p290-7 1965.

Descriptors: (*Spacecraft, USSR), Astronautics, Instrumentation, Design, Operation.

Identifiers: Vostok.

Discussion of the design and performance of the Russian Vostok spacecraft.

AD-638 916 **Field 22B, 22A**
CFSTI Prices: HC$7.00 MF$1.50
Santa Clara Univ., Calif.
PROCEEDINGS OF THE FIRST AEROSPACE MECHANISMS SYMPOSIUM, MAY 19-20 1966.
20 May 66, 331p
Prepared in cooperation with Jet Propulsion Lab., Pasadena, Calif., and Lockheed Missiles and Space Co., Palo Alto, Calif.

Descriptors: (*Aerospace craft, Symposia), (*Astronautics, Symposia), Spacecraft, Instrumentation, Space flight.

CONTENTS: Flight-proven mechanisms on the nimbus weather satellite; Extendible boom device; Mariner-IV structural dampers; Mechanism for spacecraft reflectance-degradation experiment; Noncontaminating separation systems for spacecraft (project zip); A vibration isolation mount; Gemini/agenda docking mechanism; Drag make-up sensor for low-altitude satellites; Spacecraft hydraulic timers; Solar cell gravity-stabilization booms; Analysis of aerospace impact problems; Compression-spring separation mechanisms; Mariner IV science platform structure and actuator design, development, and performance; Nonmagnetic explosive-actuated indexing device; Low-temperature effects on materials for aerospace mechanisms; High-impace-resistant mechanisms; A pyrotechnic shock isolation mechanism; Conical pivot bearings for space applications; Compression springs at elevated temperatures; Simplified space mechanisms using subliming solids; Zero-G testing of satellite inspection mechanisms; A concept for the design of variable-viscosity, variable-stiffness dampers; Analysis of a satellite angle-of-attack sensor; Explosively actuated (pyromechanical) devices for spacecraft applications; Development of a passive damper for a gravity-gradient stabilized spacecraft; An extendible structure for solar electric power in space.

N66-24108 **Field 22B**
CFSTI Prices HC$3.00 MF$0.75
Planning Research Corp., Washington, D. C.
OPERATIONAL RELIABILITY ASSESSMENT OF THE GEOS A SPACECRAFT.
by C. E. Bloomquist, W. C. Graham, J. A. Kolkin, D. B. Levinson, and R. J. Mulvihill. 29 Oct 65, 85p NASA-CR-71923, PRC-D-1056
Contract NASW-1180
Its Tech. Advisement Memo. No. 106-10

Descriptors: Beacon, Channel, Command, Converter, Decision, *Decision theory, Failure, Operational, *Operational problem, Optical, Performance, Power, Problem, *Spacecraft, *Telemetry, Theory.

For abstract, see S 04 13.

N66-24109 Field 22B
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SATELLITE SITUATION REPORT, VOLUME 6, NO. 5.
15 Mar 66, 29p NASA-TM-X-57362, X-512-66-51

Descriptors: Apogee, Decay, *Decay rate, Element, Launching, Orbital, *Orbital element, Perigee, Period, Rate, Satellite, *Satellite launching, Table, Theodolite.

For abstract, see S 04 13.

N66-24385 Field 22B
CFSTI Prices HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
TEMPERATURE CONTROL. A CASE HISTORY OF THE MARINER SPACECRAFT.
by R. K. Pefley, 1 Mar 65, 33p NASA-CR-74020, JPL-TM-33-189
Contract NAS7-100
Revision No. 1

Descriptors: Consideration, Control, Design, Family, Insulation, Interplanetary, *Mariner space probe, Probe, Space, Spacecraft, *Spacecraft design, Temperature, *Temperature control, Thermal.

For abstract, see S 04 13.

N66-24486 Field 22B
CFSTI Prices HC$8.27 MF$2.75
Westinghouse Electric Corp., Baltimore, Md.
ARIEL II ENGINEERING DATA ANALYSIS, PHASE I VOLUME II.
23 Jun 65, 528p NASA-CR-74540
Contract NAS5-9104

Descriptors: *Ariel ii satellite, Data, Engineering, *Graph, Noise, Orbit, Performance, Rate, Report, Response, Satellite, *Satellite orbit, Spin, Stabilization, Sunlight, Temperature, Thermal.

For abstract, see S 04 13.

N66-24495 Field 22B
CFSTI Prices HC$3.00 MF$0.75
Westinghouse Electric Corp., Baltimore, Md.
ARIEL II ENGINEERING DATA ANALYSIS, PHASE I, VOLUME I.
23 Jun 65, 70p NASA-CR-74565
Contract NAS5-9104

Descriptors: *Ariel ii satellite, Characteristics, Data, *Data reduction, Dynamic, Engineering, Evaluation, Launch, Orbit, Performance, *Performance characteristics, Post, Power, Rate, Reduction, Satellite, Spin, Stabilization, System, *Telemetry, Thermal, Thermistor.

For abstract, see S 04 13.

N66-24497 Field 22B
CFSTI Prices HC$7.00 MF$2.00
General Electric Co., Philadelphia, Pa.
GRAVITY GRADIENT STABILIZATION SYSTEM FOR THE APPLICATIONS TECHNOLOGY SATELLITE THIRD QUARTERLY PROGRESS REPORT, 1 JAN. - 31 MAR. 1965.
20 Apr 65, 393p NASA-CR-74571
Contract NAS5-9042

Descriptors: *Applications technology satellite (ats), Attitude, Boom, Calculation, Combination, Computer, Damper, Fortran, Gradient, Gravity, *Gravity gradient satellite, Interface, *Mathematical model, Mathematics, Model, Orbit, *Orbit calculation, Passive, Program, Satellite, Sensor, *Stabilization, System.

For abstract, see S 04 13.

N66-24500 Field 22B
CFSTI Prices HC$3.00 MF$0.75
Hughes Aircraft Co., El Segundo, Calif.
ADVANCED SYNCOM. VOLUME 4 - SYSTEM AND SUBSYSTEM PERFORMANCE REQUIREMENTS SUMMARY REPORT.
31 Oct 63, 72p NASA-CR-74580, SSD-31121R
Contract NAS5-2797

Descriptors: Antenna, Apogee, Communications, *Communications satellite, Ground, Mode, Parameter, Performance, Physical, Rocket engine, Satellite, Specification, Station, Subsystem, Synchronous, *Synchronous communications (syncom) satellite p, Syncom project, System, Transmitter, *Transponder.

For abstract, see S 04 13.

N66-24502 Field 22B
CFSTI Prices HC$6.00 MF$1.25
General Electric Co., Philadelphia, Pa.
GRAVITY GRADIENT STABILIZATION SYSTEM FOR THE ADVANCED TECHNOLOGICAL SATELLITE FIRST QUARTERLY REPORT, 29 JUN. - 30 SEP. 1964.
16 Oct 64, 217p NASA-CR-74573
Contract NAS5-9042
Its Doc.-64sd4361

Descriptors: *Applications technology satellite (ats), Boom, Combination, Current, Damper, Eddy, Gradient, Gravity, *Gravity gradient satellite, Hysteresis, Interface, *Mathematical model, Mathematics, Model, Orbit, *Orbital simulator, Passive, Power, Satellite, Sensor, Simulator, Spacecraft, *Stabilization, System.

For abstract, see S 04 13.

N66-24503 Field 22B
CFSTI Prices HC$5.00 MF$1.25
General Electric Co., Philadelphia, Pa.
GRAVITY GRADIENT STABILIZATION SYSTEM FOR THE APPLICATIONS TECHNOLOGY SATELLITE FIFTH QUARTERLY PROGRESS REPORT, 1 JUL. - 30 SEP. 1965.
20 Oct 65, 189p NASA-CR-74572
Contract NAS5-9042
Its Doc.-65sd4464

Descriptors: Analysis, *Applications technology satellite (ats), Attitude, Boom, Combination, Damper, Error, Gradient, Gravity, *Gravity gradient satellite, Passive, Satellite, Sensor, *Stabilization, System, *Systems analysis, Thrustor.

For abstract, see S 04 13.

N66-24504 Field 22B
CFSTI Prices HC$4.00 MF$0.75
Westinghouse Electric Corp., Baltimore, Md.
ARIEL II ENGINEERING DATA ANALYSIS, PHASE II.
8 Sep 65, 103p NASA-CR-74539
Contract NAS5-9104

Descriptors: Acceleration, *Ariel ii satellite, Array, Battery, Dynamic, Orbit, Orientation, Performance, Power, *Power supply, Rate, Satellite, Solar, Spacecraft, *Spacecraft performance, Spin, Supply, System, Thermal, Velocity, Voltage.

For abstract, see S 04 13.

N66-24505 Field 22B
CFSTI Prices HC$3.00 MF$0.75
General Electric Co., Philadelphia, Pa.
GRAVITY GRADIENT STABILIZATION SYSTEM FOR THE APPLICATIONS TECHNOLOGY SATELLITE FOURTH QUARTERLY PROGRESS REPORT, 1 APR. - 30 JUN. 1965.
20 Jul 65, 80p NASA-CR-74536
Contract NAS5-9042
Its Doc.-65sd4381

Descriptors: Analysis, *Applications technology satellite (ats), Capture, Damping, Data, *Data processing, Design, Evaluation, Flight, Flywheel, Gradient, Gravity, *Gravity gradient satellite, Hysteresis, Inversion, O ring, O-ring seal, Processing, Satellite, Seal, *Stabilization, System, *Systems design, Thrustor, Torque.

For abstract, see S 04 13.

N66-24635 Field 22B
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MAGNETIC FIELD RESTRAINTS FOR I M PS F AND G.
by N. F. Ness, 9 Jul 64, 15p NASA-CR-55444, X-672-64-197

Descriptors: Component, Disturbance, Electronic, Equipment, Fabrication, Field, *Imp, Magnetic, *Magnetic field disturbance, Noise, Procedure, Restraint, Spacecraft, *Spacecraft electronic equipment, Test, Wiring.

For abstract, see S 04 13.

N66-24889 Field 22B
CFSTI Prices HC$1.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
THE ORBITAL ELEMENTS OF COSMOS 2 FOR APRIL- JUNE, 1962.
by R. H. Merson, Dec 65, 24p RAE-TR-65284

Descriptors: Baker-nunn camera, Calculation, *Cosmos ii satellite, Cosmos satellite, Earth, *Earth orbit, Element, Mechanics, Observation, Optical, Orbit, Orbital, *Orbital element, Satellite, *Satellite orbit, Visual.

For abstract, see S 04 13.

N66-24929 Field 22B
CFSTI Prices HC$5.00 MF$1.00
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ANCHORED INTERPLANETARY MONITORING PLATFORM AIMP (D AND E) - E.T.R. OPERATIONS CHECK-OFF LIST.
by R. L. Courtney, D. K. Mc carthy, D. L. Miller, and E. W. Travis, May 66, 160p NASA-TM-X-55472, X-723-66-215

Descriptors: Anchor, Calculation, Checkout, Data, *Imp, Installation, *Instruction, List, *Manual, Mechanical, *Mechanical system, Sheet, System.

For abstract, see S 04 13.

N66-25161 Field 22B
CFSTI Prices HC$3.00 MF$0.75
Northrop Corp., Hawthorne, Calif.
EVALUATION OF SELF-SEALING STRUCTURES FOR SPACE VEHICLE APPLICATION.
by P. J. Danna, and R. M. Heitz, May 66, 102p NASA-CR-485
Contract NASR-102

Descriptors: Ballistics, Cabin, Compartment, Environment, *Micrometeorite, Multilayer, Pressure, *Pressurized cabin, Sealing, *Self-sealing, Space vehicle, Structure, Testing, Wall.

For abstract, see S 04 13.

N66-25549 Field 22B
CFSTI Prices HC$1.00 MF$0.75
National Aeronautics And Space Administration, Washington, D. C.

COMMUNICATIONS SATELLITES BIBLIOGRAPHY, FEB. 1965 - JAN. 1966.
May 66, 85p NASA-SP-7004/02/

Descriptors: *Abstract, Advent project, *Bibliography, Broadcasting, Communications, *Communications satellite, Echo satellite, History, Meteorology, Multiple, Operation, Orbit, Outer, Random, Satellite, Space, Station, System, Telemetry, Television, Telstar satellite.

For abstract, see S 04 14.

N66-26146 **Field 22B**
CFSTI Prices HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SURVEYOR FOLLOW-ON STUDY SCIENTIFIC OBJECTIVES. PHASE 1 - SIGNIFICANCE OF A SUCCESSFUL SURVEYOR BLOCK 1 LANDING.
by J. R. Clark, A. C. Dunk, S. M. Horowitz, D. H. Le croissette, and E. M. Silverstein. 1 Dec 64, 72p NASA-CR-74886, JPL-TM-33-192
Contract NAS7-100

Descriptors: Antenna, Camera, Component, Composition, Data, *Data transmission, Dust, Lunar, *Lunar composition, Micrometeorite, Property, Radar, Sensor, Spacecraft, *Spacecraft sensor, Surface, *Surveyor, Television, Thermal, Transmission.

For abstract, see S 04 14.

N66-26253 **Field 22B**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SATELLITE SITUATION REPORT, VOL. 6, NO. 8, APRIL 30, 1966.
30 Apr 66, 28p NASA-TM-X-57554

Descriptors: Apogee, Frequency, Inclination, Launching, Orbit, *Orbiting satellite, Perigee, Period, Rocket, Satellite, *Satellite tracking, Tracking, Transmission.

For abstract, see S 04 14.

N66-26264 **Field 22B**
CFSTI Prices HC$8.16 MF$2.50
General Electric Co., Philadelphia, Pa.
GRAVITY GRADIENT STABILIZATION SYSTEM FOR THE APPLICATIONS TECHNOLOGY SATELLITE SECOND QUARTERLY PROGRESS REPORT, 1 OCT. - 31 DEC. 1964.
10 Jan 65, 517p NASA-CR-75009, DOC.-65SD4201
Contract NAS5-9042

Descriptors: Analysis, Application, *Applications technology satellite (ats), Attitude, *Attitude control, *Boom, Computer, Control, *Damper, Gradient, Gravity, *Gravity gradient satellite, Mathematics, Model, Satellite, Sensor, Stabilization, System, *Systems analysis, Technology.

For abstract, see S 04 14.

N66-26284 **Field 22B**
CFSTI Prices HC$1.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
APPLICATION OF GROUND TEST ACOUSTIC SIMULATIONS OF LIFTOFF AND TRANSONIC VIBRATION TO ACTUAL RANGER FLIGHT VIBRATION DATA.
by M. C. Trummel. 1 May 65, 23p NASA-CR-75150, JPL-TR-32-910
Contract NAS7-100

Descriptors: Accelerometer, *Acoustics, Adapter, Density, Frequency, Lift, *Ranger project, Spectrum, Transonic, *Vibration.

For abstract, see S 04 14.

N66-26550 **Field 22B**
CFSTI Prices HC$2.00 MF$0.50
Ling-temco-vought, Inc., Dallas, Tex.
ELECTROSTATIC MEASUREMENT EXPERIMENT, SCOUT VEHICLE 131- R (S. E. V.).
by P. E. Greer. Jun 66, 41p NASA-CR-477
Contract NAS1-3657

Descriptors: Booster, Burn, Characteristic, Charge, Electrostatic, *Electrostatic charging, Engine, Launch, Performance, *Performance characteristics, *Scout launch vehicle, Sensor, Vehicle.

For abstract, see S 04 14.

N66-26552 **Field 22B**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FLIGHT REPORT - INTERPLANETARY MONITORING PLATFORM IMP-II (EXPLORER XXI).
by F. A. Carr. Jun 66, 29p NASA-TN-D-3353

Descriptors: Apollo project, Characteristics, *Imp, Interplanetary, Magnetosphere, Monitor, Performance, *Performance characteristics, Platform.

For abstract, see S 04 14.

N66-26689 **Field 22B**
CFSTI Prices HC$7.00 MF$2.00
Boeing Co., Seattle, Wash.
A SYSTEM STUDY OF A MANNED ORBITAL TELESCOPE.
Nov 65, 387p NASA-CR-66047, D2-84042-1
Contract NAS1-3968

Descriptors: Alignment, Astronomical, *Astronomical telescope, Boost, *Cassegrain optics, Condition, Design, Isolation, Laboratory, Launch, Level, Manned, *Manned orbital research laboratory (morl), Mirror, Morl, Orbital, Research, Stiffness, Stress, Structure, Telescope, Thermal.

For abstract, see S 04 14.

N66-26701 **Field 22B**
CFSTI Prices HC$3.00 MF$0.50
System Sciences Corp., Falls Church, Va.
EXPLORER XXIX (GEOS A) POSTLAUNCH PERFORMANCE EVALUATION.
by J. R. Fischel. Mar 66, 53p NASA-CR-75069
Contract NASW-1238
Its Tech. Memo.-4007-6

Descriptors: Apogee, Attitude, Capture, Characteristics, Evaluation, *Explorer satellite, Geodesy, *Geodetic surveying, Gradient, Gravity, Injection, Inversion, Maneuver, Orbit, Performance, Spacecraft, *Spacecraft performance, Stabilization, Survey, System, Telemetry, Transponder.

For abstract, see S 04 14.

N66-26746 **Field 22B**
CFSTI Prices HC$3.00 MF$0.75
Radio Corp. Of America, Princeton, N. J.
SPACECRAFT DESIGN DATA INFORMATION SYSTEM FINAL REPORT.
by R. Morgan, R. Morton, and L. Rosenberg. 15 Apr 66, 81p NASA-CR-75180, AED-R-2946
Contracts NAS7-100, JPL-951335
Prepared For Jpl

Descriptors: Data, *Data retrieval, Design, Geophysics, Index, Information, *Information processing, *Nimbus satellite, Observatory, *Ogo, Orbit, Orbiting geophysical observatory (ogo), Processing, Retrieval, Satellite, Source, Spacecraft, *Spacecraft design, System, *Tiros satellite.

For abstract, see S 04 14.

N66-26748 **Field 22B**
CFSTI Prices HC$7.33 MF$2.25
Radio Corp. Of America, Princeton, N. J.
DESIGN REPORT FOR THE TIROS OPERATIONAL SATELLITE (TOS) SYSTEM.
30 Dec 64, 433p NASA-CR-75197, AED-R-2489
Contract NAS5-3173

Descriptors: Automatic, *Camera, Conversion, Design, Equipment, Ground, Operational, Orbit, Satellite, Spacecraft, *Spacecraft design, System, *Systems design, *Tiros operational satellite system, Tiros satellite, Transmission, Video, Wheel.

For abstract, see S 04 14.

N66-26754 **Field 22B**
CFSTI Prices HC$4.00 MF$1.00
Exotech, Inc., Alexandria, Va.
ON THE FEASIBILITY OF RADIATION STERILIZATION OF PLANETARY SPACECRAFT FINAL REPORT.
by M. J. Barrett, and W. C. Cooley. 2 May 66, 141p NASA-CR-75187, TR-012
Contract NASW-130

Descriptors: Component, Dose, Effect, Gamma, *Gamma radiation, Heat, Irradiation, Microbiology, Radiation, *Radiation effect, Requirement, Spacecraft, *Spacecraft sterilization, Sterilization, Transistor, X-ray, *X-ray irradiation.

For abstract, see S 04 14.

N66-26755 **Field 22B**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SATELLITE SITUATION REPORT, VOLUME 6, NO. 6.
31 Mar 66, 69p NASA-TM-X-57542, X-512-66-51

Descriptors: Apogee, Artificial, Code, Date, Decay, *Ephemeris, Frequency, Inclination, Launch, Name, Object, Orbit, *Orbit decay, Perigee, Period, Satellite, Source, *Spacecraft, Transmission, U.s.s.r., United states.

For abstract, see S 04 14.

N66-26765 **Field 22B**
CFSTI Prices HC$5.00 MF$1.00
Radio Corp. Of America, Princeton, N. J.
TIROS X METEOROLOGICAL SATELLITE SYSTEM, VOLUME I FINAL ENGINEERING REPORT.
14 Jan 66, 164p NASA-CR-75257, AED-R-2801
Contract NAS5-3173

Descriptors: Attitude, *Attitude control, *Camera, Component, Control, Design, Launching, Magnetic, Orbit, Photography, Satellite, *Satellite orbit, Testing, *Tiros satellite.

For abstract, see S 04 14.

N66-26819 **Field 22B**
CFSTI Prices HC$2.00 MF$0.50
Perkin-elmer Corp., Norwalk, Conn. Princeton Univ. Observatory, N. J.
PRINCETON ADVANCED SATELLITE STUDY, VOLUME I FINAL SUMMARY REPORT, 8 MAR. 1965 - 15 MAY 1966.
1966, 40p NASA-CR-75299
Contract NGR-31-001-044
Prepared For Princeton Univ. Obs. Its Rept.-8346/i/

Descriptors: High resolution, Image, Instrument, *Oao, Optical, *Optical instrument, Problem, Satellite, Spectrometer, *Spectroscopic telescope, Spectroscopy, Telescope, Ultraviolet, *Ultraviolet spectrometer.

For abstract, see S 04 14.

N66-26848 **Field 22B**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administrat on, Washington, D. C.
EXPLORER XXIX (THE GEODETIC EXPLORER).
1966. 12p NASA FACTS, VOL. III, NO. 4

Descriptors: Explorer project, *Explorer satellite, Geodesy, *Geodetic satellite, Gradient, Gravity, Ground, *Instrumentation, Launch vehicle, Network, Satellite, *Satellite ground support network, Stabilization, Support, System.

For abstract, see S 04 14.

N66-26867 **Field 22B**
CFSTI Prices HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
DYNAMIC ENVIRONMENT OF THE RANGER SPACECRAFT - I THROUGH IX/ FINAL REPORT.
by D. B. Wiksten. 1 May 66, 73p NASA-CR-75273, JPL-TR-32-909
Contract NAS7-100

Descriptors: *Acoustics, Acquisition, Analysis, Data, Dynamics, *Launching, Lunar, Probe, Pyrotechnics, Ranger lunar probe, *Ranger project, *Shock, Transient, Transonic, *Vibration.

For abstract, see S 04 14.

N66-26872 **Field 22B**
CFSTI Prices HC$7.51 MF$2.00
Jet Propulsion Lab., Calif. Inst. Of Tech., Pasadena.
SEMIANNUAL REVIEW OF RESEARCH AND ADVANCED DEVELOPMENT, JULY 1, 1965 TO DECEMBER 31, 1965. VOLUME II - SUPPORTING RESEARCH AND TECHNOLOGY FOR THE OFFICE OF ADVANCED RESEARCH AND TECHNOLOGY NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.
31 Jan 66, 452p NASA-CR-75276, JPL-TM-33-272, VOL. II
Contract NAS7-100

Descriptors: Chemical, *Chemical propulsion, Communication, *Communication system, Electronic, *Electronic equipment, Equipment, Experiment, Factor, Human, *Human factor, Nuclear, *Nuclear propulsion, Power, *Power supply, Research, Rocket, Space, Space vehicle, Supply, System, Technology.

For abstract, see S 04 14.

N66-34368 **Field 22B**
CFSTI Prices HC$6.22 MF$2.75
Perkin-elmer Corp., Norwalk, Conn.
PRINCETON ADVANCED SATELLITE STUDY FINAL REPORT, 8 MAR. 1965 - 15 MAY 1966.
by H. S. Hemstreet, and W. F. Loening. 1966, 584p NASA-CR-75294
Contract NGR-31-001-044
Prepared For Princeton Univ. Obs.

Descriptors: Airborne, Aperture, *Astronomical spectrum, Astronomy, *Cassegrain optics, Design, Detector, Development, High resolution, Image, Laboratory, Large, Lens, Material, Mirror, *Oao, Orbit, Photometry, Satellite, Science, *Scientific satellite, *Spectroscopic telescope, Spectroscopy, Spectrum, Telescope, Ultraviolet, *Ultraviolet photometry.

For abstract, see S 04 20.

N66-34857 **Field 22B**
CFSTI Prices HC$2.50 MF$0.75
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
FLIGHT PARAMETERS AND VEHICLE PERFORMANCE FOR PROJECT FIRE FLIGHT II, LAUNCHED MAY 22, 1965.
by J. H. Lewis Jr, and W. I. Scallion. Aug 66, 106p NASA-TN-D-3569

Descriptors: Atmosphere, Blunt, Characteristic, Environment, Fire, *Fire project, Flight, *Flight characteristics, Gas, Heat transfer, Heating, *Nasa program, Performance, Program, Project, Radiance, Reentry, Spacecraft, *Spacecraft performance, Trajectory, Vehicle, Velocity.

For abstract, see S 04 20.

N66-34861 **Field 22B**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration, Washington, D. C.
GEMINI 11.
2 Sep 66, 69p NASA NEWS RELEASE-66-226

Descriptors: *Atlas agena launch vehicle, Countdown, Crew, Disposal, Docking, Experiment, Food, *Gemini spacecraft, Launch vehicle, Manned, Mission, Propulsion, Reentry, Retrofire, Rocket, Separation, Space, *Space mission, Spacecraft, Target, Tracking, Training.

For abstract, see S 04 20.

N66-34863 **Field 22B**
CFSTI Prices HC$3.00 MF$0.75
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TOS MISSION OPERATIONS PLAN FOR WTR LAUNCHES.
Aug 66, 89p NASA-TM-X-55554, X-480-66-387

Descriptors: Forecasting, Launch, Management, Mission, Operation, Picture, Plan, Range, Satellite, System, Telemetry, Test, *Test range, *Tiros operational satellite system, Tracking, Vidicon, Weather, *Weather forecasting, West.

For abstract, see S 04 20.

N66-35223 **Field 22B**
CFSTI Prices HC$2.50 MF$0.75
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AERO-ASTRODYNAMICS CONSIDERATIONS FOR THE APOLLO TELESCOPE MOUNT.
by R. E. Lavender. 8 Aug 66, 96p NASA-TM-X-53500

Descriptors: Aerodynamic, Aerodynamics, Analysis, *Apollo project, Control, Dynamics, Lifetime, Lunar, Mission, Module, Mounting, Orbital, *Telescope, Torque.

For abstract, see S 04 20.

AD-638 919 **See Field 14B**

AD-638 920 **See Field 8D**

AD-639 060 **See Field 6K**

AD-639 204 **See Field 6K**

AD-639 298 **See Field 14B**

AD-639 347 **See Field 21C**

AD-639 378 **See Field 22A**

AD-639 441 **See Field 22A**

N66-25435 **See Field 21H**

N66-25469 **See Field 14B**

22C. SPACECRAFT TRAJECTORIES AND REENTRY

AD-475 218 **Field 22C**
CFSTI Prices: HC$1.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
THE ORBIT OF TIROS 7 (1963-24A) FEBRUARY 13-23, 1965.
Technical rept.
by Diana W. Scott. Oct 65, 22p TR-65221
N66-15146

Descriptors: (*Meteorological satellites, *Orbital trajectories), Programming (Computers), Satellite tracking systems, Errors, Tables, Great Britain.

Identifiers: TIROS, Minitrack.

The orbit of Tiros 7 has been determined from Minitrack observations for part of February 1965, using the RAE orbit improvement programme. A table of orbital parameters is given for 7 nodes spaced at 25-node intervals. The orbital elements are compared with those given by the NASA orbit of the satellite. (Author)

AD-477 251 **Field 22C**
CFSTI Prices: HC$1.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
RESONANCE EFFECTS FOR SATELLITES WITH NOMINALLY CONSTANT GROUND TRACK.
Technical rept.
by R. R. Allan. Aug 65, 24p TR-65232
N66-15678

Descriptors: (*Satellites (Artificial), Orbital trajectories), (*Orbital trajectories, Resonance), Communication satellites (Active), Celestial mechanics, Gravity, Harmonic analysis, Stability, Great Britain.

Identifiers: Constant-ground-track satellites.

Since a 'constant-ground-track' satellite would continually pass over the same regions of the Earth, such orbits are in resonance with the longitude dependent part of the Earth's gravitational field. The situation is similar, but not completely analogous, to the case of synchronous satellites. For beta revolutions per day, the ground track will oscillate in longitude with a maximum amplitude of plus or minus 180/beta degrees, the periods of oscillation being usually of the order of a few years for beta = 2, 3 and 4. These effects depend strongly on the inclination of the orbit. (Author)

AD-480 259 **Field 22C**
CFSTI Prices: HC$2.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
OPTIMUM IMPULSIVE TRANSFERS BETWEEN NON-COPLANAR ELLIPTIC ORBITS HAVING COLLINEAR MAJOR AXES.
Technical rept.
by H. Hiller. Dec 65, 26p TR-65287

Descriptors: (*Transfer trajectories, Elliptical orbit trajectories), Optimization, Inclined orbit trajectories, Velocity, Mathematical analysis, Equations, Mathematical prediction, Space propulsion, Great Britain.

The total characteristic velocity has been optimised for impulsive transfers between non-coplanar elliptic orbits having a common centre of attraction and collinear major axes in the same sense. Up to three apsidal impulses have been considered

with the whole plane change occurring at the (coincident) apocentres of the semi-elliptic (Hohmann-type) transfer paths. For three-impulse transfers, the optimum mode is to transfer between pericentres of the initial and final elliptic orbits. For two-impulse (tilted-Hohmann) transfers, the optimum mode is to transfer from the pericentre of the inner ellipse to the apocentre of the outer ellipse; for overlap configurations of initial and final elliptic orbits, optimum transfers from one ellipse to another with larger pericentric distance are from apocentre to pericentre. (Author)

AD-481 077 **Field 22C, 4B**
CFSTI Prices: HC$1.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
THE EFFECT OF A MERIDIONAL WIND ON A SATELLITE ORBIT.
Technical rept.
by D. G. King-Hele. Jan 66, 23p TR-66010
N66-22876

Descriptors: (*Orbital trajectories, *Wind), Satellites (Artificial), Force (Mechanics), Mathematical analysis, Great Britain.

Theoretical formulae are derived which show the effect of a meridional (south-to-north) wind on a satellite orbit of eccentricity less than 0.2. The aerodynamic force acting on the satellite, which is normally important only over a small section of the orbit near perigee, is assumed to be in the direction opposite to the satellite's motion relative to the ambient air, so that meridional motion of the upper atmosphere slightly alters the direction of the drag. The resulting changes in the satellite's orbital inclination and the right ascension of the node are evaluated. For a satellite whose perigee remains near the equator, a consistent meridional wind of 100 metres/sec in the vicinity of perigee can change the orbital inclination by 0.02 degrees as the orbital period decreases by 10 min; but when perigee moves widely, the effect is generally much smaller. (Author)

AD-639 050 **Field 22C**
CFSTI Prices: HC$3.00 MF$0.75
Boeing Scientific Research Labs., Seattle, Wash. Mathematics Research Lab.
PERTURBATIONS OF THE ORBITS OF ARTIFICIAL SATELLITES BY AN ATTRACTION OF EXTERNAL BODIES.
by Zdenek Kopal. Aug 66, 63p D1-82-0558, Mathematical note-478

Descriptors: (*Satellites (Artificial), Orbital trajectories), (*Orbital trajectories, Perturbation theory), Interference, N-body problem.

The aim of the paper is to investigate analytically the secular as well as periodic perturbations of the orbits of artificial satellites of the Earth or the Moon, due to an attraction of external masses, by Brown's application of Delaunay's method for the stellar case of three bodies. Two families or orbital perturbations are studied in particular: namely, short-range (secular and periodic) perturbations, arising in the course of a time interval during which the motion of the disturbing third body can be ignored; and long-range perturbations, for which the longitude of the third body becomes a function of the time, but short-range perturbations can be averaged. Analytical expressions for such perturbations of all six elements of the satellite's orbit are given in terms of certain parameters which specify the magnitude of the disturbing force, and the entire analysis carried out to the first powers of these quantities. (Author)

AD-639 578 **Field 22C, 12A**
CFSTI Prices: HC$3.00 MF$0.75
Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
AN APPLICATION OF AN ANALOG COMPUTER TO SOLVE THE TWO-POINT BOUNDARY-VALUE PROBLEM FOR A FOURTH ORDER OPTIMAL CONTROL PROBLEM.
Master's thesis.
by Vincent J. Darcy. Jun 66, 65p GGC/EE/66-7

Descriptors: (*Boundary value problems, *Analog computers), (*Rendezvous trajectories, *Optimization), Control, Equations of motion.

Identifiers: Theses, Pontryagin's maximum principle.

The application of Pontryagin's Maximum Principle to trajectory optimization problems results in a two-point boundary-value problem. An analog computer is used in conjunction with a human operator who has a display of the phase planes of the admissible trajectories. The human operator, having a general knowledge of the behavior of the system, adjusts control law parameters until the boundary conditions of the system are satisfied. This technique was applied to a time-optimal rendezvous with bounds on rocket thrust and fuel available and demonstrated that accurate analog computer solutions are possible. (Author)

AD-639 579 **Field 22C**
CFSTI Prices: HC$3.00 MF$0.75
Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.
A PRELIMINARY STUDY OF A METHOD FOR IMPROVING POINTING ACCURACY OF A GRAVITY GRADIENT SYSTEM.
Master's thesis.
by Walter Edward Davis. Jun 66, 79p GGC/EE/66-8

Descriptors: (*Attitude control systems, *Gravity), (*Satellite attitude, Control), Equations of motion, Torque.

Identifiers: Theses.

The report is a preliminary study of attitude control in a high altitude satellite in which the gravity gradient stabilization rod is gimballed to produce reaction torques and to augment the gravity gradient restoring torques. The single axis perturbation equation describing the small angle motion of such a configuration is presented. An analytical solution of the steady-state frequency response of the system is carried out and as a result, active system requirements for reducing attitude errors are proposed based on the system response to periodic disturbances. The passive and active system responses are compared. (Author)

N66-24386 **Field 22C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Ames Research Center, Moffett Field, Calif.
A SIMPLE ATMOSPHERE REENTRY GUIDANCE SCHEME FOR RETURN FROM THE MANNED MARS MISSION.
by R. E. Coate, and H. C. Lessing. May 66, 29p NASA-TN-D-3422

Descriptors: Atmosphere, *Atmospheric entry, Density, Entry, Guidance, Manned, *Manned reentry, Mars, *Mars spacecraft, Mission, Parameter, Reentry, *Reentry guidance, Return, Scheme, Spacecraft, Tracking, Trajectory.

For abstract, see S 04 13.

N66-24501 **Field 22C**
CFSTI Prices HC$2.00 MF$0.50
Westinghouse Electric Corp., Baltimore, Md.
ALTITUDE DETERMINATION BY KALMAN FILTERING THIRD QUARTERLY PROGRESS REPORT.
by J. L. Farrell. Feb 66, 48p NASA-CR-74577
Contract NAS5-9195

Descriptors: Analysis, Angular, *Attitude, Celestial, Determination, Dynamic, Equation, Euler equation, Filtering, Gradient, Gravity, Inertial, *Inertial reference system, *Kalman-schmidt filter, Libration, *Mathematical model, Mathematics, Mechanics, Model, Motion, Orbit, Reference, Rotation, Satellite, Statistical, System, Transformation.

For abstract, see S 04 13.

N66-24583 **Field 22C**
CFSTI Prices HC$3.00 MF$0.50
Vanderbilt Univ., Nashville, Tenn.
APPLICATIONS OF CALCULUS OF VARIATIONS TO TRAJECTORY ANALYSIS FINAL REPORT.
by M. G. Boyce, and J. L. Linnstaedter. Mar 66, 53p NASA-CR-74611
Contract NAS8-2619

Descriptors: Algebra, Analysis, Calculus, Euler-lagrange equation, Matrix, Multistage, *Multistage rocket, Optimization, Rocket, Trajectory, *Trajectory analysis, Variation, *Variational calculus, Weierstrass problem.

For abstract, see S 04 13.

N66-24588 **Field 22C**
CFSTI Prices HC$5.00 MF$1.00
Texas Univ., Austin.
FIRST ORDER CONTROL FOR LOW-THRUST INTERPLANETARY VEHICLES.
by W. T. Fowler. May 65, 156p NASA-CR-74618, EMRL-TR-1001
Grant NSG-551

Descriptors: Calculus, Control, Equation, First, *First order equation, Function, Guidance, Interplanetary, *Interplanetary spacecraft, Low thrust, *Low thrust propulsion, Mathematics, Model, Order, Problem, Propulsion, Spacecraft, *Spacecraft control, Trajectory, Vehicle, *Weierstrass problem.

For abstract, see S 04 13.

N66-24693 **Field 22C**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
VARIATIONS OF THE LUNAR ORBITAL PARAMETERS OF THE APOLLO C S M-MODULE.
by T. P. Timer. Feb 66, 21p NASA-TM-X-55460, X-507-66-60

Descriptors: *Apollo project, Command, *Command module, Landing, Lunar, *Lunar orbit, Module, Moon, Orbit, Parameter, Parking, *Parking orbit, Selenography, Service, *Service module, Site.

For abstract, see S 04 13.

N66-24886 **Field 22C**
CFSTI Prices HC$1.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
PERTURBATIONS OF NEAR-CIRCULAR ORBITS BY THE EARTH'S GRAVITATIONAL POTENTIAL.
by G. E. Cook. Nov 65, 24p RAE-TR-65252

Descriptors: Circular, *Circular orbit, Earth, Earth orbit, Gravitational, *Gravitational potential, Harmonics, Mechanics, Near, Orbit, Orbital, Oscillation, *Perturbation, Potential, Zone.

For abstract, see S 04 13.

N66-24887 **Field 22C**
CFSTI Prices HC$2.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
OPTIMUM IMPULSIVE TRANSFERS BETWEEN NON- COPLANAR ELLIPTIC ORBITS HAVING COLLINEAR MAJOR AXES.
by H. Hiller. Dec 65, 30p RAE-TR-65287

Descriptors: Axis, Characteristic, Collinear, Coplanar, Ellipse, *Elliptical orbit, Impulse, *Impulse orbital transfer, Major, Mechanics, Nonplanar, Optimum, Orbit, Orbital, *Orbital mechanics, Transfer, Velocity.

For abstract, see S 04 13.

N66-24891 **Field 22C**
CFSTI Prices HC$1.00 MF$0.50
Royal Aircraft Establishment, Farnborough (England).
REFINEMENT OF ALOUETTE I ORBIT, FOR THE PERIOD 27 APRIL - 6 MAY 1964.
by H. Hiller. Jan 66, 22p RAE-TR-66020

Descriptors: *Alouette i satellite, Axis, Calculation, Correction, Differential, Earth, *Earth orbit, Eccentricity, Major, Mechanics, Method, Orbit, *Orbit calculation, Orbital, Perigee, Satellite, *Satellite orbit.

For abstract, see S 04 13.

N66-25165 **Field 22C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Ames Research Center, Moffett Field, Calif.
MANUAL ABORT GUIDANCE FROM THE MID-COURSE REGION OF A LUNAR MISSION.
by G. P. Callas, and R. B. Merrick. May 66, 42p NASA-TN-D-3402

Descriptors: Abort, *Abort trajectory, Control, Guidance, Inertial, Lunar, *Lunar probe, Manual, *Manual control, Measurement, Midcourse, Mission, Probe, Trajectory, Unit, Velocity.

For abstract, see S 04 13.

N66-25318 **Field 22C**
CFSTI Prices HC$3.00 MF$0.50
Toronto Univ. (Ontario).
A SOLUTION FOR ATMOSPHERIC ENTRY TRAJECTORIES DEVIATING FROM EQUILIBRIUM GLIDE.
by M. Hanin. Apr 66, 54p UTIAS-111

Descriptors: Atmospheric, *Atmospheric entry, Deviation, Entry, Equation, Equilibrium, Glide, Lifting, *Lifting reentry, Motion, *Motion equation, Oscillation, Reentry, *Reentry trajectory, Solution, Vehicle.

For abstract, see S 04 13.

N66-25529 **Field 22C**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INJECTION AND MIDCOURSE CORRECTION ANALYSIS FOR THE GALACTIC PROBE.
by R. T. Groves. 24 Jan 66, 25p NASA-TM-X-57511

Descriptors: Attitude, *Attitude control, Control, Correction, Error, Flyby, *Flyby mission, Galaxy, Guidance, *Injection, Jupiter, *Jupiter (planet), *Midcourse guidance, Mission, Model, Monte carlo method, Planet, Probe, Trajectory.

For abstract, see S 04 14.

N66-25530 **Field 22C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GALACTIC PROBE TRAJECTORY PARAMETERS - 1969 TO 1972 LAUNCH OPPORTUNITIES.
by R. E. Coady. 17 Feb 66, 39p NASA-TM-X-57510

Descriptors: Date, Earth, Energy, Flight, *Flight time, *Injection, *Jupiter (planet), Launch, *Launch date, Launch vehicle, Mission, Payload, Planet, Probe, Space, Sun, Time, Velocity.

For abstract, see S 04 14.

N66-25553 **Field 22C**
CFSTI Prices HC$2.00 MF$0.50
Trw Systems, Redondo Beach, Calif.
DEVELOPMENT OF AN ORBIT DETERMINATION PROGRAM TO REGRESS FOR LUNAR POTENTIAL CONSTANTS.
by F. J. Lombard. 1966, 49p NASA-CR-66065
Contract NAS1-4605-3

Descriptors: Calculation, Computer, *Computer program, Constant, Coordinate, *Coordinate system, Lunar, *Lunar orbit, Orbit, *Orbit calculation, Orbital, Parameter, Potential, Program, Regression, Satellite, *Satellite orbit, State, *State vector, System, Trajectory, Vector.

For abstract, see S 04 14.

N66-25554 **Field 22C**
CFSTI Prices HC$2.00 MF$0.50
Trw Systems, Redondo Beach, Calif.
EVALUATION OF THE USE OF OCCULTATION DATA IN DIFFERENTIAL CORRECTION PROCEDURES FOR DETERMINATION OF THE LUNAR ORBIT.
by D. H. Lenis. 1966, 38p NASA-CR-66095
Contract NAS1-4605-3

Descriptors: Calculation, Convergence, Correction, Data, Differential, *Earth, Energy, Error, Lunar, *Lunar satellite, *Occultation, Orbit, *Orbit calculation, Reduction, Satellite, *Satellite orbit, State, *Sun, Time, Uncertainty, Vector.

For abstract, see S 04 14.

N66-25557 **Field 22C**
CFSTI Prices HC$5.00 MF$1.25
Trw Systems, Redondo Beach, Calif.
MATRIX SENSITIVITY ANALYSIS FOR LUNAR SATELLITE ORBITS.
by C. B. Sheckells. 1966, 181p NASA-CR-66066
Contract NAS1-4605-3

Descriptors: Analysis, Covariance, *Error, Lunar, *Lunar satellite, Matrix, *Matrix analysis, Mission, Orbit, Precision, Satellite, *Satellite orbit, *Sensitivity.

For abstract, see S 04 14.

N66-26276 **Field 22C**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. Langley Research Center, Langley Station, Va.
DEFINITION OF LATERAL-RANGE AND LIFT-DRAG-RATIO REQUIREMENTS FOR RETURN TO BOTH OPTIMUM AND NONOPTIMUM RECOVERY SITES.
by P. F. Holloway, and E. B. Pritchard. May 66, 39p NASA-TR-R-237

Descriptors: Circular, *Circular orbit, Drag, Inclination, Lateral, Latitude, Lift, *Lift-drag ratio, Orbit, Plane, Range, Ratio, *Recovery, Site, Spacecraft.

For abstract, see S 04 14.

N66-34324 **Field 22C**
CFSTI Prices HC$1.00 MF$0.50
National Aeronautics And Space Administration. Lewis Research Center, Cleveland, Ohio.
MAGNETIC FIELD OUTSIDE PERFECT RECTANGULAR CONDUCTORS.
by L. Flax, and J. H. Simmons. Aug 66, 21p NASA-TN-D-3572
Contract 129-02-05-02-22

Descriptors: Approximation, Conductor, Current, *Current distribution, Distribution, Electric, *Electric conductor, Electrostatic, Equation, Field, Flow, Infinite, Magnetic, *Magnetic field, Parameter, Potential, Rectangle, Solution, Surface.

For abstract, see S 04 20.

N66-34926 **Field 22C**
CFSTI Prices HC$3.00 MF$1.00
National Aeronautics And Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROCEEDING OF THE TWENTY- FOURTH SEMINAR ON SPACE FLIGHT AND GUIDANCE THEORY PROGRESS REPORT NO. 8, 1 APR. - 31 DEC. 1965.
23 Jun 66, 146p NASA-TM-X-53478
Seminar Held 16-17 Feb. 1966, Sponsored By Aero-astrodynamics Lab.

Descriptors: Analysis, *Conference, Control, Derivative, Differential, Equation, Feedback, Guidance, *Guidance stability, Hamiltonian, Lagrange equation, Liapunov function, *Mathematics, *Space flight, Stability, *Stability derivative, System, Theory, Trajectory.

For abstract, see S 04 20.

N66-35234 **Field 22C**
CFSTI Prices HC$3.00 MF$0.75
Aeronutronic, Newport Beach, Calif.
ANALYSIS OF PERTURBATION SOLUTIONS OF VARIED THRUST TRAJECTORIES FINAL REPORT.
by R. R. Auelmann, and P. T. Lane. 27 Jun 66, 84p NASA-CR-77499, U-3637
Contract NAS8-20150

Descriptors: Capture, Circular, *Circular orbit, Escape, Interplanetary, *Interplanetary transfer, Low thrust, *Low thrust propulsion, Orbit, *Perturbation, Planetary, *Planetary orbit, Problem, Propulsion, Solution, Transfer.

For abstract, see S 04 20.

AD-638 722 **See Field 4A**

AD-639 378 **See Field 22A**

22D. SPACECRAFT LAUNCH VEHICLES AND GROUND SUPPORT

N66-24489 **Field 22D**
CFSTI Prices HC$3.00 MF$0.50
North American Aviation, Inc., Downey, Calif.
ENGINEERING METHOD TO PREDICT SATURN V VEHICLE AND LAUNCH COMPLEX ENVIRONMENTS DUE TO ROCKET JET IMPINGEMENT QUARTERLY PROGRESS REPORT NO. 3, 1 JAN. - 31 MAR. 1965.
by A. Africano. 15 Apr 65, 53p NASA-CR-74556, SID-65-550
Contract NAS8-11407

Descriptors: Exhaust, Flow, Force, Free, Gas, Geometry, Heat, Heat transfer, Impact, *Impingement, Interaction, Jet, *Jet plume, *Launch complex, Load, Molecular, Particle, Photon, Plume, Radial, Radiation, *Saturn v launch vehicle, Stream.

For abstract, see S 04 13.

N66-24547 **Field 22D**
CFSTI Prices HC$3.00 MF$0.75
Hayes International Corp., Birmingham, Ala.
LAUNCH VEHICLE WIND RESPONSE BY STATISTICAL METHODS ENGINEERING REPORT NO. 1193.
by J. E. Bailey. 29 Nov 65, 72p NASA-CR-74639
Contract NAS8-20201

Descriptors: Analysis, Bending, Computer, Control, *Control system, Drift, Harmonic, Input, Lateral, *Lateral stability and control, Launch, *Launch vehicle, Load, *Mathematical model, Mathematics, Model, Moment, Nonstationary, Pressure, Profile, Program, Response, Stability, Statistical, System, Vehicle, Wind, *Wind profile.

For abstract, see S 04 13.

N66-24576 **Field 22D**
CFSTI Prices HC$2.00 MF$0.50
Hayes International Corp., Birmingham, Ala.
SIMPLIFIED CRITERIA FOR MINIMUM LOAD AND DRIFT CONTROL OF LARGE BOOSTER VEHICLE ENGINEERING REPORT NO. 1214.
by D. L. St. john. 22 Dec 65, 44p NASA-CR-74461
Contract NAS8-20201

Descriptors: Acceleration, Bending, Body, Closed, Control, *Control system, Drift, Feedback, Function, Lateral, *Lateral stability and control, Launch, *Launch vehicle, Loading, Loop, *Mathematical model, Mathematics, Minimum, Model, Moment, Rigid, *Rigid body, Stability, Structural, System, Transfer, Vehicle, Velocity, Wind.

For abstract, see S 04 13.

N66-24962 **Field 22D**
CFSTI Prices HC$5.00 MF$1.00
Lockheed Missiles And Space Co., Huntsville, Ala.
WEIGHT-SAVING THROUGH USE OF BERYLLIUM- ALUMINUM ALLOYS FOR SATURN-TYPE VEHICLE STRUCTURES FINAL REPORT, 24 APR. 1965 - 24 MAR. 1966.
by H. H. Armstrong. Mar 66, 178p NASA-CR-74788, LMSC/HREC-A782443
Contract NAS8-11298

Descriptors: Alloy, Aluminum, Beryllium, *Beryllium alloy, Compound, Cryogenics, Ductility, Elasticity, Isotropic, Launch vehicle, Rigidity, *Saturn launch vehicle, Stability, *Structural weight, Table.

For abstract, see S 04 13.

N66-24979 **Field 22D**
CFSTI Prices HC$5.00 MF$1.00
Lockheed Missiles And Space Co., Huntsville, Ala.
WEIGHT-SAVING THROUGH USE OF BERYLLIUM- ALUMINUM ALLOYS FOR SATURN-TYPE VEHICLE STRUCTURES.
by H. H. Armstrong. Dec 65, 170p NASA-CR-74674, HREC/1298-1
Contract NAS8-11298

Descriptors: Alloy, Aluminum, *Aluminum alloy, Beryllium, *Beryllium alloy, Compression, Launch vehicle, Light, *Light metal, Lightweight, Loading, Material, Metal, *Saturn launch vehicle, Structural.

For abstract, see S 04 13.

N66-25018 **Field 22D**
CFSTI Prices HC$5.00 MF$1.25
Systems Technology, Inc., Hawthorne, Calif.
TRANSFER FUNCTION APPROXIMATIONS FOR LARGE HIGHLY COUPLED ELASTIC BOOSTERS WITH FUEL SLOSH.
by J. J. Best, L. G. Hofmann, W. A. Johnson, R. L. Stapleford, and C. D. Wezeman. Apr 66, 173p NASA-CR-464
Contract NAS8-11419

Descriptors: Approximation, Bending, Body, Characteristics, Control, Coupling, Dynamic, Elastic, Flexible, *Flexible body, Frequency, Fuel, Function, *Launch vehicle, Liquid, *Liquid sloshing, Sloshing, Transfer, *Transfer function.

For abstract, see S 04 13.

N66-25527 **Field 22D**
CFSTI Prices HC$2.00 MF$0.50
National Aeronautics And Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
TECHNIQUES FOR THE REMOTE MONITORING OF HYPERGOLIC PROPELLANT LEAKS.
by P. M. Ricca. 25 Feb 66, 30p NASA-TM-X-7519, GP-220

Descriptors: Equipment, Gas, Ground, *Ground support equipment, Hazard, Hypergolic, *Hypergolic propellant, *Leakage, Malfunction, Monitor, Propellant, Safety, *Saturn v launch vehicle, Sensor, Support, Toxicity, *Toxicity and safety hazard, Vehicle.

For abstract, see S 04 14.

N66-26820 **Field 22D**
CFSTI Prices HC$3.00 MF$0.75
Lockheed Missiles And Space Co., Sunnyvale, Calif.
THE AEROELASTIC CHARACTERISTICS OF THE SATURN-IB AND SATURN-V LAUNCH VEHICLES.
Mar 65, 79p NASA-CR-75301, M-37-65-1
Contract NAS8-11238

Descriptors: Aerodynamic, *Aeroelasticity, Apollo project, Booster, Damping, Elastic, Flow, *Flow separation, Launch vehicle, Load, Payload, Saturn ib launch vehicle, *Saturn v launch vehicle, Separation, Trajectory, Vehicle.

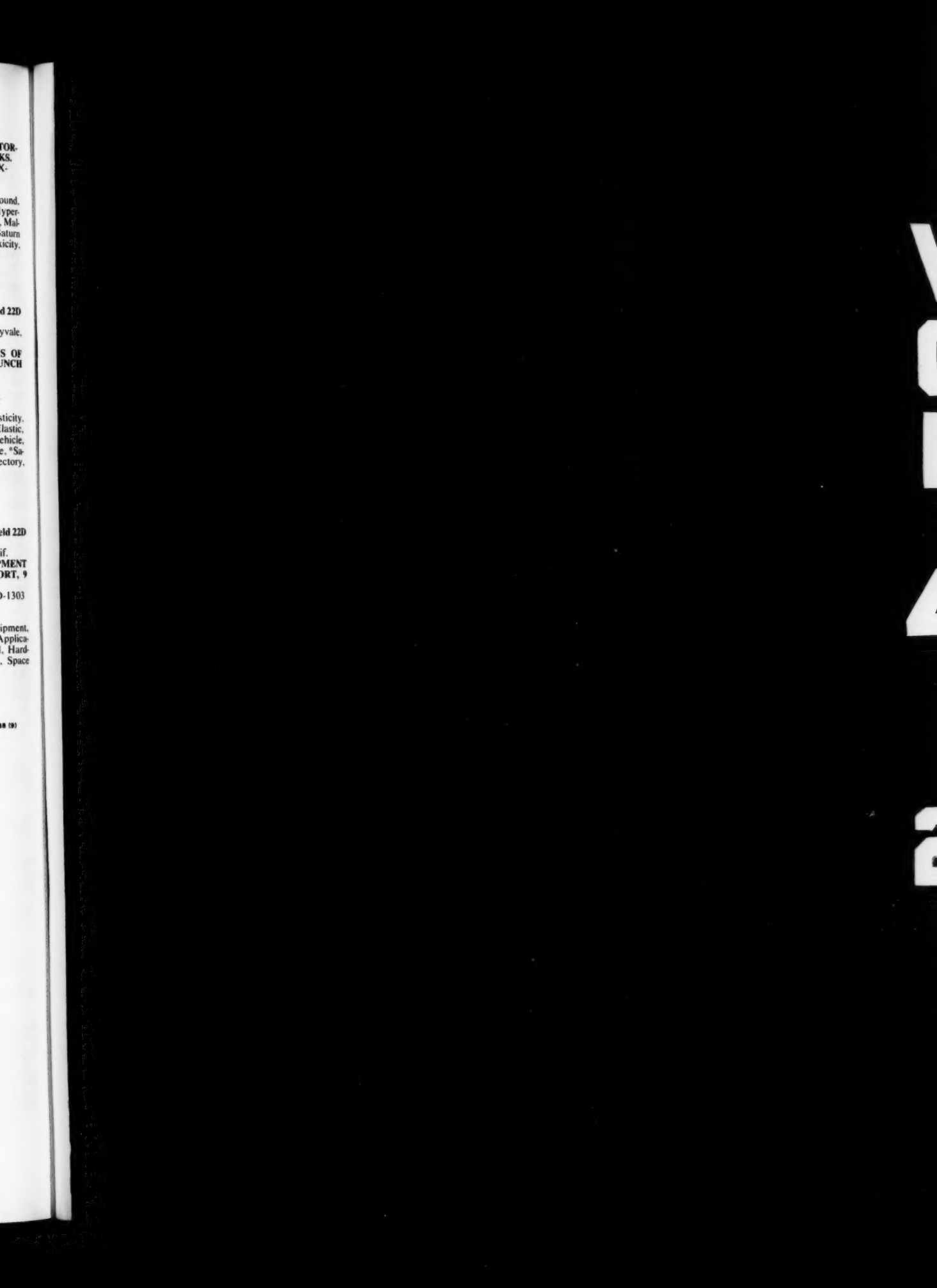
For abstract, see S 04 14.

N66-34803 **Field 22D**
CFSTI Prices HC$1.00 MF$0.50
Planning Research Corp., Los Angeles, Calif.
AN AIRBORNE EVALUATING EQUIPMENT STUDY QUARTERLY PROGRESS REPORT, 9 MAY - 8 AUG. 1966.
12 Aug 66, 10p NASA-CR-77337, PRC-D-1303
Contract NAS8-20367

Descriptors: Airborne, *Airborne equipment, *Apollo project, Apollo spacecraft, Application, Equipment, Evaluation, Ground, Hardware, Operation, Program, Software, Space vehicle.

For abstract, see S 04 20.

* U.S. GOVERNMENT PRINTING OFFICE : 1968 OL—252-068 (8)



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S. K. (

NASA-N
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NASA

GQA 327

PENNSYL
ENGINEE
PENNSYL

AERODYN

B. W. M

DA-31-1
/65-

DOD-ARM

IGF 420

USAF, AF

AERODYNA
PRESSURE

J. L. PO

AF-40-60
/65-

DOD-AIR

ZGN 9303

USN, HEA

PERSONNE
EVALUATI

A. R. POL

/65-

DOD-NAVY

ZGN 9309

USN, BUR
MARYLAND

AIRCRAFT

D. LINQUI

/65-

DOD-NAVY

CURRENT r & d PROJECTS

01 AERONAUTICS

****

GH 524 1 FIELD 1C, 1B

UNIVERSITY OF MICHIGAN, SCHOOL OF ENGINEERING, ENGINEERING MECHANICS, MICHIGAN

STRUCTURAL ANALYSIS OF AIRCRAFT TIRES

S. K. CLARK

NASA-NSG-344-E-7
1/64-12/64.

NASA

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GQA 327 2 FIELD 1C, 1B,20D,20K

PENNSYLVANIA ST UNIV, SCHOOL OF ENGINEERING, AERONAUTICAL ENGIN, PENNSYLVANIA

AERODYNAMIC PROBLEMS OF V/STOL AIRCRAFT

B. W. MCCORMICK

DA-31-124-ARO-D-149
/65- /

DOD-ARMY

****

ZGF 420557 FIELD 20D,20K

USAF, ARNOLD AFS, TENNESSEE

AERODYNAMIC PROBLEMS IN EXTREME LOW PRESSURE HIGH MACH FLIGHT REGIMES

J. L. POTTER

AF-40-600-01000
/65- /

DOD-AIR FORCE

****

ZGN 530371 1 FIELD 5E,10R

USN, WEAPON LAB DAHLGN, VIRGINIA

PERSONNEL ESCAPE PROPULSION SYSTEMS EVALUATION

A. R. POWELL

/65- /

DOD-NAVY

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ZGN 530524 4 FIELD 13J,12A

USN, BUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

AIRCRAFT CARRIER-DECK MOTION STUDIES

D. LINGUIST

/65- /

DOD-NAVY

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ZGN 530528 2 FIELD 1B,20D

USN, BUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

AERODYNAMICS - WIND TUNNEL TESTS AND EQUIPMENT

R. BROBERG

/65- /

DOD-NAVY

****

ZGN 530529 3 FIELD 1B

NAVAL AIR DEVELOPMENT, PENNSYLVANIA

AIRCRAFT FLIGHT STABILITY AND CONTROL STUDY

W. KOVEN

/65- /

DOD-NAVY

****

ZGN 530566 FIELD 1C, 1B,20K,15G

USN, BUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

AGM-37A TARGET/F-8 AIRPLANE LAUNCH/SEPARATION AND COMPATIBILITY PROGRAM

R. BROBERG

/65- /

DOD-NAVY

****

ZGN 530567 FIELD 1B,20D,15C

USN, BUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

FIREYE STORE DROP INVESTIGATION

R. BROBERG

/65- /

DOD-NAVY

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ZGN 530570 FIELD 20L,20D,20K,15G

USN, BUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

ROCKEYE II DISPENSER SEPARATION INVESTIGATION

R. BROBERG

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DOD-NAVY

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ZGN 530582 FIELD 5E,10R

PERSONNEL ESCAPE PROPULSION SYSTEMS

A. R. POWELL

/65- /

DOD-NAVY

****

ZGN 530595 FIELD 20L,20K,10B

NAVAL AIR DEVELOPMEN, PENNSYLVANIA

STRUCTURE FABRICATION METHODS FATIGUE STUDIES

A. P. COWLES

/65- /

DOD-NAVY

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ZGN 530597 FIELD 20L,20K

NAVAL AIR DEVELOPMEN, PENNSYLVANIA

STRAIN AND FATIGUE STUDIES IN AIRCRAFT STRUCTURES

A. P. COWLES

/65- /

DOD-NAVY

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ZGN 530707 FIELD 1C, 1B,20D,20K

USN, BUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

MODEL A-7A AIRPLANE SPIN MODEL CONSTRUCTION AND 0.05 SCALE HIGH SPEED MODEL MODIFICATION

R. BROBERG

/65- /

DOD-NAVY

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ZGN 530709 FIELD 1C, 1B,20D

USN, BUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

AIRCRAFT/STORE CAPTIVE FLIGHT/LAUNCH AERODYNAMIC CHARACTERISTICS INVESTIGATION

R. BROBERG

/65- /

DOD-NAVY

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ZGN 530710 FIELD 1C, 1B,20D,20K

USN, BUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

MODEL OV-10A AIRPLANE SPIN MODEL CONSTRUCTION

R. SHUBERO

/65- /

DOD-NAVY

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ZON 544080

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

PERMANENT AIR FACILITY FOR MCMURDO ANTARTICA

E. H. MOSER, R. A. PAIGE

/65- /

DOD-NAVY

03 ASTRONOMY AND ASTROPHYSICS

****

GH 499 3 FIELD 3A, 3B, 4A

CORNELL UNIVERSITY, SCHOOL OF ENGINEERING, ASTRONOMY + SPACE SCI, NEW YORK

SUPPORT TO A RESEARCH PROGRAM OF LUNAR STUDIES AND THE STRUCTURE OF THE EARTHS MAGNETOSPHERE

T. GOLD, W. I. AXFORD, P. MORRISON
E. SALPETER

NSG-382
11/65-10/66

NASA

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GH 667 3 FIELD 3A, 3B, 9+

STANFORD UNIVERSITY, SCHOOL OF ENGINEERING, ELECTRICAL ENGINEERING, CALIFORNIA

MONOSTATIC RADAR ASTRONOMY

V. R. ESHLEMAN, L. T. DOLPHIN, R. B. DYCE
O. K. GARRIOTT, H. T. HOWARD
R. L. LEADABRAND, B. B. LUSIGNAN

NSG-377
1/66-12/66

NASA

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GH 1777 FIELD 3A

INVESTIGATION OF LUMINOSITY CRITERIA IN O AND IN STARS

A. U. LANDOLT

NGR-19-001-009
9/65- 8/66

NASA

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GH 1890 FIELD 3A

USAF, AER CHART + INFO, ST LOUIS, MISSOURI

SUPPORT LUNAR TOPOGRAPHIC SERVICES

• NONE

R-108
10/64- 6/65

NASA

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GQA 302 1 FIELD 3A, 3B, 4A, 7B

RADIO ASTRONOMY - MICROWAVE ATMOSPHERIC STUDIES

A. H. BARRETT, A. E. BARRETT

DA-36-039-AMC-03200E
/65- /

DOD-ARMY

****

GQF 925 7 FIELD 3A, 5A,20I

PLASMA PHYSICS + RELATED TOPICS OF ASTROPHYSICS

P. A. STURROCK

AF-49-638-01321
/65- /

DOD-AIR FORCE

****

GQF 936 7 FIELD 3A, 5A,20I,20J

NEW YORK UNIVERSITY, GRADUATE SCHOOL, PHYSICS, NEW YORK

STELLAR FLUID DYNAMICS

E. A. SPIEGEL

AF-AFOSR-0644-64
/65- /

DOD-AIR FORCE

****

ZQF 260062 FIELD 17G, 3A, 3B, 4A

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

SOLAR EUV INTENSITY MEASUREMENTS

L. A. HALL

/65- /

DOD-AIR FORCE

****

ZQF 260097 FIELD 13B, 3A, 3B,14E

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

PLANETARY PHOTOGEOLOGY

J. F. CRONIN

/65- /

DOD-AIR FORCE

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ZQF 260125 FIELD 3A, 3B,20F

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

INFRARED CELESTIAL BACKGROUNDS

R. G. WALKER

/65- /

DOD-AIR FORCE

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ZQF 260133 FIELD 22A, 3A

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

LUNAR AND PLANETARY SURFACE MATERIALS UNDER SIMULATED ENVIRONMENT

J. W. SALISBURY

/65- /

DOD-AIR FORCE

****

ZUG 805 FIELD 3A, 5A

MULTIDISCIPLINARY RESEARCH LEADING TO UTILIZATION OF EXTRATERRESTRIAL RESOURCES

T. C. ATCHISON, D. E. FOGELSON
C. W. SCHULTZ, O. TERICHOW

INT-BM-A4164100
/66- /

INTERIOR-BUREAU OF MINES

04 ATMOSPHERIC SCIENCES

****

7ZX 510 2 FIELD 13A,13B, 7D, 4B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

DEVELOPMENT OF ANALYTICAL METHODS FOR METEOROLOGICAL TRACERS

A. ALTSHULLER

BSS-B-2-9
7/64- 6/65

PHS-BSS

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7ZX 510 3 FIELD 13A,13B, 7D, 4B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

DEVELOPMENT OF ANALYTICAL METHODS FOR METEOROLOGICAL TRACERS

A. ALTSHULLER

BSS-B-2-9
7/65- 6/66

PHS-BSS

****

GH 336 4 FIELD 12A, 6E

UNIV OF WISCONSIN, GRADUATE SCHOOL, METEOROLOGY, WISCONSIN

METEOROLOGICAL-SATELLITE DATA PROCESSING

V. E. SUOMI

NASA-NASW-65-SA-2
5/64- 4/65

NASA

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GH 809 2 FIELD 4A

UNIVERSITY OF CHICAGO, GRADUATE SCHOOL, PHYSICS, ILLINOIS

A THEORETICAL INVESTIGATION OF UPPER ATMOSPHERE DYNAMICS

C. O. HINES

NSG-467
7/65- 6/66

NASA

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GH 1196 1 FIELD 4A, 9+, 9A,12A

UNIVERSITY OF MICHIGAN, SCHOOL OF ENGINEERING, ELECTRICAL ENGINEERING, MICHIGAN

RESEARCH ON NONLINEAR INTERACTION PHENOMENA IN THE IONSPHERE

J. E. ZOWE, H. C. HSIEH, R. J. LOMAX
NSG-696
6/65- 9/66

NASA

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GH 1633 FIELD 4A, 5A,20I

UNIVERSITY OF MARYLAND, GRADUATE SCHOOL, PHYSICS + ASTRONOMY, MARYLAND

ANALYSIS OF SATELLITE DATA FOR STUDIES RELATED TO IONOSPHERIC PLASMA RESEARCH

R. T. BETTINGER

NGR-21-002-060

4/65- 3/66

NASA

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GQA 423 1 FIELD 4A,12A,20H, 5A

UNIVERSITY OF MARYLAND, GRADUATE SCHOOL, PHYSICS + ASTRONOMY, MARYLAND

THEORETICAL AND EXPERIMENTAL DETERMINATION OF POTENTIAL CURVES

J. T. VANDERSLICE, S. WEISSMAN

DA-ARO-D-31-124-G466
/65- /

DOD-ARMY

****

ZGF 260043 FIELD 9C, 8+, 9+

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

REMOTE DETECTION TECHNIQUES

W. H. PAULSEN

/65- /

DOD-AIR FORCE

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ZGF 260046 FIELD 22A, 9C, 9+

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

SOUNDING SYSTEM STUDY

R. LEVITON

/65- /

DOD-AIR FORCE

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ZGF 260047 FIELD 1C

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

ROCKET SOUNDING PROGRAM DEVELOPMENT

R. LEVITON

/65- /

DOD-AIR FORCE

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ZGF 260051 FIELD 8+, 9+,12A

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

RADAR WEATHER INSTRUMENTATION TECHNIQUES

W. J. SWEENEY

/65- /

DOD-AIR FORCE

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ZGF 260067 FIELD 12A,22C, 8F

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

DATA REDUCTION AND PROCESSING

R. S. HAWKINS

/65- /

DOD-AIR FORCE

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ZGF 260095 FIELD 19D,21I, 4A,15D

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

FIELD STUDIES OF CHEMICAL RELEASE TECHNIQUES

N. W. ROSENBERG

/65- /

DOD-AIR FORCE

****

ZGF 260110 FIELD 4A, 9+, 9A

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

PROBE INSTRUMENTATION RESEARCH AND DEVELOPMENT

C. W. REYNOLDS

/65- /

DOD-AIR FORCE

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ZGF 260147 FIELD 8H,12A,20D

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

PLANETARY-SCALE CIRCULATIONS

L. BERKOFSKY

/65- /

DOD-AIR FORCE

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ZUA 820 FIELD 8F, 8H, 8+, 9+

USDI, GEOL SURV PHOENX, ARIZONA

LOW FREQUENCY RADAR TRACKING OF PRECIPITATION

W. E. SWIRTZKE, R. H. BROWN
G. M. ROBINSON

RMA-106-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

05 BEHAVIORAL AND SOCIAL SCIENCES

****

GH 1279 1 FIELD 5A

A PROGRAM TO ACCELERATE THE INDUSTRIAL APPLICATION OF AEROSPACE RELATED TECHNOLOGY

H. STILLWELL, H. E. BOOTH, P. GORDEN
E. E. BORSETH, G. CORRON
G. L. DARDARIAN, N. DUNCAN

NASR-175
1/65-12/65

NASA

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GH 1798

A PRELIMINARY STUDY OF THE POTENTIAL CONTRIBUTIONS OF SPACE AND TECHNOLOGY TO THE ALLIANCE FOR PROGRESS

J. F. LEE

NSR-09-120-001
7/65- 6/66

NASA

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GH 1819

AMER INST AERON + ASTR, DIST OF COLUMBIA

EXPANSION OF AIAA TO PROVIDE A COMPREHENSIVE COVERAGE OF LITERATURE IN THE AEROSPACE SCIENCES

J. J. GLENNON

NASR-130
1/65- 6/65

NASA

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GH 1830

DEVELOPMENT OF TWO 40-FRAME SOUND COLOR FILM-STRIPS OF ART WORK ON SPACE-RELATED SUBJECTS

- NONE

NSR-09-125-002
7/65-12/65

NASA

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GH 1840

PRODUCTION OF A TELEVISION SERIES - NASA ON SPACE

- NONE

NSR-39-020-001
7/65- 6/66

NASA

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ZON 542137 1 FIELD 15+, 9+

USN, BUR NAV PERSON, SAN DIEGO, CALIFORNIA

DESIGN DEVELOPMENT AND EVALUATION OF EXPERIMENTAL TRAINING FOR ELECTRONICS

E. I. JONES, A. V. ANDERSON

/65- /

DOD-NAVY

****

ZON 542138 1 FIELD 15+, 9+

USN, BUR NAV PERSON, SAN DIEGO, CALIFORNIA

SURVEY OF INFORMATION ON ELECTRONICS TRAINING METHODS AND MATERIALS

A. V. ANDERSON, J. H. STEINEMANN

/65- /

DOD-NAVY

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ZUG 838 FIELD 8D,20L

USDI, BUR MINES, DENVER, COLORADO

SCIENCE ADVISORY SERVICE

L. OBERT

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INTERIOR-BUREAU OF MINES

06 BIOLOGICAL AND MEDICAL SCIENCES

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AMER DENTAL ASSN CHI, ILLINOIS

ALLOYS OF GALLIUM FOR USE IN DENTISTRY

R. M. WATERSTRAT, R. +. WATERSTRAT

4/66- 3/67

PHS-NIH-NATL INST DENTAL RESEARCH

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1NB 4985 3 FIELD 6B, 9•, 9A, 9D

REDUNDANCY OF POTENTIAL COMMAND

W. S. MCCULLOCH, M. BLUM, R. M. DIAZ
W. L. KILMER, S. PAPERT, C. P. SCHNABEL

12/65-11/66

PHS-NIH-NATL INST NEUROL DIS + BLINDNESS

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7ZX 221 3 FIELD 13B, 7C, 7D, 7A

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

PHYSICAL AND CHEMICAL PROPERTIES OF BIOLOGICALLY-ACTIVE AEROSOLS

H. J. STEVENSON, E. CORDIER, J. P. FLESCH
J. F. ROESLER, D. E. SANDERSON
G. VANDERZANDEN

BSS-B-3-4
/66- /

PHS-BSS

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ZUG 843 FIELD 6B, 9•, 9A

USDI, BUR MINES, PITTSBURGH, PENNSYLVANIA

NOISE LEVELS ASSOCIATED WITH SUPPLIED-AIR RESPIRATORS

R. W. SCHUTZ, B. I. FERBER, E. J. KLOOS
J. A. LAMONICA

INT-BMHS-20-17
/66- /

INTERIOR-BUREAU OF MINES

07 CHEMISTRY

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10M 10693 4 FIELD 7C, 7D, 7A,20J

UNIV OF PENNSYLVANIA, GRADUATE SCHOOL, CHEMISTRY, PENNSYLVANIA

MASS SPECTRAL AND ELECTRICAL DISCHARGE STUDIES

E. R. THORNTON, S. WANG

1/66-12/66

PHS-NIH-DIV GENERAL MEDICAL SCIENCES

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7ZX 217 3 FIELD 7C, 7A, 7D, 7B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

PHOTOCHEMICAL AND KINETIC INVESTIGATIONS

A. P. ALTSHULLER, J. J. BUFALINI
I. R. COHEN, S. L. KOPCZYNSKI

BSS-B-2-4
/66- /

PHS-BSS

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7ZX 218 3 FIELD 7C, 7D,20J, 7B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

ANALYTICAL METHODOLOGY ON ORGANIC PARTICULATES

E. SAWICKI, D. F. BENDER, J. E. SIGSBY
T. W. STANLEY

BSS-B-2-2
/66- /

PHS-BSS

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7ZX 219 3 FIELD 7C, 7D, 7A

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

POLYNUCLEAR HYDROCARBON AND RELATED COMPOUND ANALYSES

E. SAWICKI, W. C. ELBERT, J. E. MEEKER

BSS-B-2-1
/66- /

PHS-BSS

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GH 445 3 FIELD 12A,20J, 7B

PURDUE UNIVERSITY, GRADUATE SCHOOL, PHYSICS, INDIANA

HIGH PRECISION SPECTROSCOPY

K. L. ANDREW, S. C. BAKER, W. G. BRILL

NSG-301
2/66- 1/67

NASA

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GPE 1076 FIELD 7D, 7A,20J

RADIATION INDUCED PROCESSES IN GASES

J. A. LLEWELLYN

AT(40-1)3349
3/65- 2/66

AEC-BIOLOGY + MEDICINE

••••••••••

GPE 1136 FIELD 7C, 7D,20D,18A

WESTERN RESERVE UNIV, SCHOOL OF MEDICINE, RADIOLOGY, OHIO

IONIZATION IN LIQUID GASES

E. C. GREGG, W. VOELKER

W-31-109-ENG-78
10/65- 9/66

AEC-BIOLOGY + MEDICINE

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GPE 1205 FIELD 7C, 7D, 7A,18A

ELECTRON AFFINITIES AND ELECTRON CAPTURE

R. E. GLICK, R. •. GLICK, J. A. LLEWELLYN
C. RILEY

AT(40-1)2690
9/65- 8/66

AEC-BIOLOGY + MEDICINE

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GPE 1209 FIELD 7C, 7D,20M

PHASE TRANSITIONS IN POLYMERS

L. MANDELKERN, L. •. MANDELKERN

AT(40-1)2690
9/65- 8/66

AEC-BIOLOGY + MEDICINE

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GPF 25 3 FIELD 7C, 7D, 7A, 7B

UNIV OF TENNESSEE, GRADUATE SCHOOL, CHEMISTRY, TENNESSEE

STUDIES DEALING WITH THE RATES OF CATALYTIC REACTIONS INVOLVING DEUTERIUM

H. A. SMITH, S. AKHTAR, H. H. CHEN

AT(40-1)1069
1/66-12/66

AEC-DIVISION OF PHYSICAL RES

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GPF 56 4 FIELD 7C, 7D, 7A

UNIV OF TENNESSEE, GRADUATE SCHOOL, CHEMISTRY, TENNESSEE

RADIATION CHEMISTRY REACTION MECHANISMS OF ALKYL HALIDES + OLEFINS IN THE CONDENSED STATE

F. WILLIAMS

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1/66-12/66

AEC-DIVISION OF PHYSICAL RES

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GPF 113 3 FIELD 7C, 7D, 7B

UNIV OF CONNECTICUT, GRADUATE SCHOOL, CHEMISTRY, CONNECTICUT

ANALYTICAL CHEMISTRY AT LOW CONCENTRATIONS

J. T. STOCK

AT(30-1)1977
12/65-11/66

AEC-DIVISION OF PHYSICAL RES

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GPF 175 3 FIELD 7D,20M,20J, 7B

VANDERBILT UNIVERSITY, GRADUATE SCHOOL, PHYSICS, TENNESSEE

THE SPECTRA OF FLUORINE COMPOUNDS

E. A. JONES

AT(40-1)1087
12/65-11/66

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GPF 179 3 FIELD 7D, 7A,14E, 7B

CLARKSON COL OF TECH, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, NEW YORK

PERFORMANCE OF PACKED COLUMNS

H. L. SHULMAN, W. MELLISH

AT(30-1)1463
1/66-12/66

AEC-DIVISION OF PHYSICAL RES

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GPF 289 3 FIELD 7C, 7D,20J,20F

COLUMBIA UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, NEW YORK

THEORETICAL CHEMISTRY

R. BERSOHN, D. CROSLEY, J. SOLOMAN

AT(30-1)2498
9/65- 8/66

AEC-DIVISION OF PHYSICAL RES

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GPF 334 3 FIELD 7D, 7A,20M, 7B

YALE UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, CONNECTICUT

CORRELATION OF THERMODYNAMIC AND TRANSPORT PROPERTIES OF LIQUID MIXTURES

P. A. LYONS, G. ALLEN, H. S. HARNED
M. T. RECORD

AT(30-1)1375
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GPF 338 3 FIELD 7D,12A,20J,18A

UNIVERSITY OF MICHIGAN, GRADUATE SCHOOL, CHEMISTRY, MICHIGAN

ENERGETIC RECOIL ATOM REACTION MECHANISMS

A. W. GORDUS

AT-11-1-912
6/65- 6/66

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GPF 434 2 FIELD 7C, 7D, 7A, 7B

CORNELL UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, NEW YORK

HOMOGENOUS - GAS PHASE ISOTOPE EXCHANGE REACTIONS IN SHOCK TUBES

S. H. BAUER, P. JEFFERS

AT-30-1-3211
8/65- 7/66

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GPF 484 3 FIELD 7C, 7D, 7B

UNIV OF KENTUCKY, GRADUATE SCHOOL, CHEMISTRY, KENTUCKY

PROPERTIES OF SOLVENTS HAVING HIGH DIELECTRIC CONSTANTS

L. R. DAWSON, H. C. ECKSTROM

AT-40-1-2451
10/65- 9/66

AEC-DIVISION OF PHYSICAL RES

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GPF 487 3 FIELD 7C, 7D, 7A,20M

UNIVERSITY OF ARIZONA, GRADUATE SCHOOL, CHEMISTRY, ARIZONA

THE DEVELOPMENT AND TESTING OF ORGANIC REAGENTS FOR USE IN INORGANIC ANALYSIS

G. FERNANDO, H. FREISER

AT-11-1-676
9/65- 8/66

AEC-DIVISION OF PHYSICAL RES

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GPF 568 3 FIELD 7D,18A,20L, 7B

MASS INST OF TECHNOL, GRADUATE SCHOOL, CHEMISTRY, MASSACHUSETTS

NUCLEAR CHEMISTRY

C. D. CORYELL, G. E. GORDON, J. W. IRVINE G. S. SCATCHARD

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GPF 570 3 FIELD 7C, 7A, 7D, 7B

UNIVERSITY OF OREGON, GRADUATE SCHOOL, CHEMISTRY, OREGON

DIFFUSION CONTROLLED REACTIONS AND EXCHANGE REACTIONS IN SOLUTIONS

R. M. NOYES, C. Y. MOK, M. NAKASHIMA D. R. PERRY

AT-45-1-1310
9/65- 9/66

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GPF 574 1 FIELD 7D,11F,13H,12A

CITY UNIV N Y BROOKLYN, GRADUATE SCHOOL, CHEMISTRY, NEW YORK

APPLICATIONS OF NUCLEAR AND RADIOCHEMICAL TECHNIQUES IN CHEMICAL ANALYSIS

H. L. FINSTON, Y. INOUE, E. WILLIAMS

AT(30-1)3417
5/65- 9/66

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GPF 908 3 FIELD 7C, 7D, 7A,20M

FISK UNIVERSITY, GRADUATE SCHOOL, PHYSICS, TENNESSEE

INFRARED SPECTROSCOPIC STUDIES OF POLYATOMIC INORGANIC IONS IN SOLID SOLUTIONS

J. R. LAWSON, N. FUSONG, E. SILBERMAN

AT-40-1-2760
9/65- 8/66

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GPF 945 FIELD 7D, 7B

NORTHWESTERN UNIV, GRADUATE SCHOOL, CHEMISTRY, ILLINOIS

PHYSICAL CHEMISTRY OF HIGHLY ENERGETIC SYSTEMS

F. E. STAFFORD, S. C. LIN, E. A. STAFFORD

AT(11-1)1147
2/66- 2/67

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GPF 947 FIELD 7A, 7D,20M,12A

RENSSELAER POLYTC INST, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, NEW YORK

STUDIES OF GAS-PARTICLE HEAT TRANSFER COEFFICIENTS IN PACKED BEDS BY FREQUENCY RESPONSE TECHNIQUES

H. LITTMAN

AT(30-1)-3639
1/66-12/66

AEC-DIVISION OF PHYSICAL RES

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GPF 950 FIELD 7C, 7D, 7A,20M

ION EXCHANGE RESINS

R. H. WILEY

AT(30-1)-3644
1/66-12/66

AEC-DIVISION OF PHYSICAL RES

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GPF 968 FIELD 20M, 5A,18A,20F

UNIVERSITY OF MAINE, GRADUATE SCHOOL, PHYSICS, MAINE

EFFECTS OF RADIATION ON ALKALI AZIDES USING ELECTRON SPIN RESONANCE TECHNIQUES

D. W. WYLIE, J. BISCOE

AT(30-1)-3681
4/66- 3/67

AEC-DIVISION OF PHYSICAL RES

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GQA 311 1 FIELD 20M, 5A,20F,20L

OPTICAL AND INFRARED SPECTROSCOPY

C. H. PERRY, C. A. PERRY

DA-36-039-AMC-03200E
/65- /

DOD-ARMY

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GQA 347 1 FIELD 7A, 7D,20M,20J

BROWN UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, RHODE ISLAND

DETAILED STUDIES OF CHEMICAL REACTION KINETICS

E. F. GREENE, J. ROSS

DA-31-124-ARO-D-163
/65- /

DOD-ARMY

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GQA 412 8 FIELD 20J

UNIVERSITY OF IOWA, GRADUATE SCHOOL, CHEMISTRY, IOWA

INFRARED INTENSITY STUDIES OF CONDENSED PHASES

W. B. PERSON

DA-ARO-D-31-124-G387
/65- /

DOD-ARMY

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GQA 426 1 FIELD 7D, 7C, 7A,20M

NORTHWESTERN UNIV, GRADUATE SCHOOL, CHEMISTRY, ILLINOIS

INFRARED SPECTRA ON HIGH TEMPERATURE MOLECULES

F. E. STAFFORD

DA-31-124-ARO-D-222
/65- /

DOD-ARMY

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GQA 455 2 FIELD 7D, 7B

FLUORINE OXIDIZERS

R. TOENISKOETTER

DA-31-124-ARO-D-77
/65- /

DOD-ARMY

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GQF 8 9 FIELD 3A, 5A,20I,20D

GEORGIA INST OF TECH, GRADUATE SCHOOL, PHYSICS, GEORGIA

MASS SPECTROGRAPHIC STUDY OF LOW FIELD MOBILITY DIFFUSION + REACTIONS OF IONS IN GASES

D. W. MARTIN

AF-49-638-01392
/65- /

DOD-AIR FORCE

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GQF 24 10 FIELD 3A, 3B, 9+, 5A

JOHNS HOPKINS UNIV, GRADUATE SCHOOL, PHYSICS, MARYLAND

FAR INFRARED SPECTROSCOPY

J. D. STRONG

AF-49-638-01432
/65- /

DOD-AIR FORCE

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GQF 58 7 FIELD 20D,20L, 7B

GENERAL DYNAMICS CORP, SAN DIEGO, CALIFORNIA

INTERACTIONS BETWEEN HYDROGEN AND OXYGEN ATOMS AND SURFACES

J. N. SMITH

AF-49-638-01435
/65- /

DOD-AIR FORCE

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GQF 916 7 FIELD 5A,18A, 7D

UNIV OF CAL-BERKELEY, GRADUATE SCHOOL, PHYSICS, CALIFORNIA

ATOMIC AND MOLECULAR BEAM RESEARCH

H. A. SHUGART

AF-AFOSR-0346-62
/65- /

DOD-AIR FORCE

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GQF 919 6 FIELD 5A, 7B

UNIVERSITY OF OKLAHOMA, GRADUATE SCHOOL, PHYSICS, OKLAHOMA

ATOMIC TRANSITION PROBABILITIES

R. G. FOWLER

AF-49-638-01404
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DOD-AIR FORCE

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GQF 930 6 FIELD 5A,20F,20L, 7B

JOHNS HOPKINS UNIV, GRADUATE SCHOOL, PHYSICS, MARYLAND

SPECTRA OF DOUBLY AND TRIPLY IONIZED RARE EARTHS

G. H. DIEKE

AF-49-638-01497
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DOD-AIR FORCE

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GQF 975 5 FIELD 7C, 7D, 7A,20M

CORNELL UNIVERSITY, SCHOOL OF ENGINEERING, ELECTRICAL ENGINEERING, NEW YORK

KINETICS OF CHEMICAL REACTIONS IN SHOCK TUBES

E. L. RESLER, E. *. RESLER

AF-49-638-01448
/65- /

DOD-AIR FORCE

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GQF 2075 4 FIELD 7C, 7A, 7D,20J

STATE UNIV N Y BUFFALO, GRADUATE SCHOOL, CHEMISTRY, NEW YORK

DIELECTRIC CONSTANT OF HYDROGEN BONDED LIQUIDS

W. DANNHAUSER

AF-AFOSR-0271-63
/65- /

DOD-AIR FORCE

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GQF 3030 3 FIELD 7D,20J, 7B

UNIV OF LONDON, UNITED KINGDOM

ELECTRON SPIN RESONANCE SPECTRA OF METAL COMPLEXES

D. J. MILLEN

AF-EOAR-0026-62
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GQF 3219 3 FIELD 7C, 7D,20M,20C

UNIVERSITY OF CHICAGO, GRADUATE SCHOOL, CHEMISTRY, ILLINOIS

DIFFUSION IN SOLIDS AND LIQUIDS AT HIGH PRESSURES

N. H. NACHTRIEB

AF-AFOSR-0600-64
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DOD-AIR FORCE

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GQF 3225 3 FIELD 7D, 7A,20M,20F

UNIVERSITY OF ILLINOIS, GRADUATE SCHOOL, CHEMISTRY + CHEM ENGIN, ILLINOIS

MATRIX ISOLATION AND MASS SPECTROETRIC STUDIES OF SPECIES PRODUCED IN A SHOCK TUBE

R. L. BELFORD

AF-AFOSR-0588-64
/65- /

DOD-AIR FORCE

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GQF 3229 3 FIELD 7C, 7D, 7A,20F

UNIV OF LEICESTER, UNITED KINGDOM

METALS IN NON-METALLIC SOLVENTS

M. C. SYMONS

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GQF 3241 3 FIELD 7D,20M,20L, 7B

UNIV OF TEXAS, AUSTIN, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, TEXAS

CRYSTAL CHEMISTRY OF THE SYSTEMS RARE EARTHS-GROUPS V AND VI ELEMENTS

H. STEINFINK, E. J. WEISS

AF-AFOSR-0806-65
/65- /

DOD-AIR FORCE

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GQF 3477 2 FIELD 7C, 7D, 7A,20J

JOHNS HOPKINS UNIV, GRADUATE SCHOOL, CHEMISTRY, MARYLAND

HIGH RESOLUTION STUDIES IN THE FAR INFRARED

D. W. ROBINSON

AF-49-638-01430
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GQF 3553 2 FIELD 7C, 7D,20J, 7B

UNIVERSITY OF COLORADO, GRADUATE SCHOOL, CHEMISTRY, COLORADO

NMR STUDIES OF INTRA-AND INTERMOLECULAR INTERACTIONS

M. W. HANNA

AF-AFOSR-0216-65
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GQF 3601 2 FIELD 5A,20J, 7B

STATE UNIV N Y BUFFALO, GRADUATE SCHOOL, PHYSICS, NEW YORK

EFFECTS OF EXTERNAL MAGNETIC AND ELECTRIC FIELDS ON SMALL MOLECULES

R. P. HURST

AF-AFOSR-0191-63
/65- /

DOD-AIR FORCE

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GQF 3724 1 FIELD 3A, 7A,20J, 5A

UNIVERSITY OF FLORIDA, GRADUATE SCHOOL, PHYSICS, FLORIDA

LOW-ENERGY IONIC COLLISIONS

T. L. BAILEY

AF-AFOSR-0471-64
/65- /

DOD-AIR FORCE

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GQF 3738 1 FIELD 7C, 7A, 7D,20J

UNIV OF TORONTO, GRADUATE SCHOOL, CANADA

KINETICS OF ION FORMATION DURING CHEMICAL REACTION IN SHOCK WAVES

J. E. DOVE

AF-AFOSR-0504-64
/65- /

DOD-AIR FORCE

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ZQF 260008 FIELD 7C, 7D,20M,11B

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

PHYSICAL CHEMISTRY OF ELECTROMAGNETIC MATERIALS

B. RUBIN

/65- /

DOD-AIR FORCE

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ZQF 284681 4 FIELD 7C, 7D,20M, 7B

USAF, AFSC, RTD, WRIGHT-PATT-AF MAT LAB, OHIO

ORGANOMETALLIC RESEARCH

H. ROSENBERG

/65-

DOD-AIR FORCE

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ZQF 284686 3 FIELD 7C, 7D,20M,9B

USAF, AFSC, RTD, WRIGHT-PATT-AF MAT LAB, OHIO

PHYSICAL CHEMISTRY OF HIGH POLYMERS

I. J. GOLDFARB

/65- /

DOD-AIR FORCE

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ZUG 855 FIELD 7C,21D, 7D

USDI, BUR MINES, DIST OF COLUMBIA

ULTRA-HIGH PRESSURE REACTIONS

R. W. HITESHUE, P. DOBRANSKY, S. FRIEDMAN J. R. SALMON

INT-BM-11114121-4
/66- /

INTERIOR-BUREAU OF MINES

08 EARTH SCIENCES AND OCEANOGRAPHY

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72X 327 3 FIELD 8C

USDHEW, BSS, N-WEST, SHELLFISH SANI RES CTR, WASHINGTON

OCEANOGRAPHIC METHODS

P. S. KELLEY

BSS-2-11
/66- /

PHS-BSS

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GH 1662 FIELD 9+

USDC, NATL BUR STAN, DIST OF COLUMBIA

CONSTRUCT AND INSTALL THREE-COMPONENT COIL MAGNETOMETERS AT EACH OF TEN EXISTING MICROPULSATION GROUND SUPPORT STATIONS

W. H. CAMPBELL

A-110
9/65- 8/66

NASA

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GPE 593 2 FIELD 8D, 8H, 4A, 8C

UNIV OF WASHINGTON, GRADUATE SCHOOL, CHEMISTRY, WASHINGTON

HYDROSPHERE-ATMOSPHERE RADIOCHEMICAL MEASUREMENTS

A. W. FAIRHALL

AT(45-1)1776
5/65- 4/66

AEC-BIOLOGY + MEDICINE

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GPF 941 FIELD 7C, 8D, 8G, 7B

CARBON, OXYGEN, AND SULFUR ISOTOPES + THE ORIGIN + SOURCES OF URANIUM MINERALIZATION

H. L. JENSEN

AT(11-1)1553
10/65-10/66

AEC-DIVISION OF PHYSICAL RES

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GQA 181 FIELD 8F,15G

NAMIB DESERT RESEARCH

C. KOCH

DA-ARO-49-092-63-G15
/65- /

DOD-ARMY

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GQF 3392 2 FIELD 8K, 5A

ST. LOUIS UNIVERSITY, SCHOOL OF ENGINEERING, GEOPHYS + GEOPHYS ENGR, MISSOURI

S WAVE PROJECT FOR FOCAL MECHANISM STUDIES

H. V. STAUDER

AF-AFOSR-0458-62
/65- /

DOD-AIR FORCE

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ZQF 260076 FIELD 17G, 3A, 3B

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

AEROSPACE GEODOSY APPLICATIONS

M. S. HUNT

/65- /

DOD-AIR FORCE

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ZQF 260157 FIELD 13B, 8N, 8Q

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

BASIC RESEARCH ON FUNDAMENTAL EARTH CONSTANTS

R. M. PERRY

/65- /

DOD-AIR FORCE

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ZQF 260172 FIELD 8D, 8Q,20L

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

MINERAL PROPERTIES AND BEHAVIOR

K. E. SEIFERT

/65- /

DOD-AIR FORCE

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ZTA 231 1 FIELD 8D

US, SMITHSONIAN INST, DIST OF COLUMBIA

JURASSIC FORAMINIFERA FROM THE WESTERN INTERIOR OF THE UNITED STATES

R. CIFELLI

/66- /

SMITHSONIAN INSTITUTION

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ZUA 696 3 FIELD 8D, 8H, 8Q

USDI, GEOL SURV ARLGTN, VIRGINIA

SPATIAL DISTRIBUTION OF CHEMICAL CONSTITUENTS IN GROUND WATER

W. RACK

ACA-5-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUA 735 2 FIELD 8F, 8E,12A

MATHEMATICAL GEOMORPHOLOGY

A. E. SCHEIDEGGER

MCA-13-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUA 751 2 FIELD 8D, 8H

PERMIAN BASIN - ORIGIN OF SALINE WATER DISCHARGE

R. R. STEVENS

RMA-115-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUA 757 2 FIELD 13G, 8H

USDI, GEOL SURV, DIST OF COLUMBIA

DETERMINATION OF MANNING COEFFICIENT FROM MEASURED BED ROUGHNESS

J. T. LIMERINOS

CAL-406-C
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUA 766 1 FIELD 13G, 8H, 8Q

FLOW AND SEDIMENT TRANSPORT, RIO GRANDE CONVEYANCE CHANNEL

J. K. CULBERTSON

RMA-116-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUA 783 1 FIELD 8F, 8H

SOURCES, MOVEMENT, AND DISTRIBUTION OF SEDIMENT IN A SMALL WATER SHED

M. G. WOLMAN

ACA-36-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUA 785 1 FIELD 8F, 8H, 8Q

GEOLOGIC HISTORY OF THE COLORADO RIVER

C. B. HUNT

ACA-19-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUA 805 1 FIELD 13G, 8H

CROSS CHANNEL DIFFUSION

R. R. WRIGHT

ACA-39-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUA 816 FIELD 13B, 8F, 8H, 8W

GEOLOGIC STRUCTURE AND FRESH GROUND WATER IN GULF COASTAL PLAIN

P. H. JONES

MCA-11-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUQ 804 FIELD 8D

USDI, BUR MINES, SPOKANE, WASHINGTON

IMPROVED COAL MINE SUPPORT SYSTEMS FOR STEEPLY DIPPING VEINS

W. S. ANDERSON

INT-BM-6111551-12
/66- /

INTERIOR-BUREAU OF MINES

****

ZUQ 806 FIELD 8K, 8G, 8D

USDI, BUR MINES, DENVER, COLORADO

LABORATORY GEOPHYSICAL STUDIES

R. H. BECKER

INT-BM-6111521-10
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 807 FIELD 8K, 8G, 8D

USDI, BUR MINES, DENVER, COLORADO

PROPERTIES AND USE OF MICROSEISMS

R. M. BECKER

INT-8M-6111521-11
/66- /

INTERIOR-BUREAU OF MINES

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ZUG 816 FIELD 7C, 7D, 8D, 7B

USDI, BUR MINES, PITTSBURGH, PENNSYLVANIA

DEVELOPMENT OF CHROMATOGRAPHIC TECHNIQUES FOR MINE AIR ANALYSIS

R. W. FREEDMAN

INT-8MHS-20-11
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 818 FIELD 7C, 7D,21D, 8D

USDI, BUR MINES, PITTSBURGH, PENNSYLVANIA

CONTAMINANT GASES IN COAL MINES

R. W. FREEDMAN, H. W. LANG

INT-8MHS-20-13
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 825 FIELD 8G, 8D

USDI, BUR MINES, DENVER, COLORADO

IN SITU DETERMINATION OF INELASTIC ROCK PROPERTIES

R. L. LAPPI

INT-8M-6111521-21
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 829 FIELD 8D,20K

USDI, BUR MINES, PITTSBURGH, PENNSYLVANIA

SPECIFICATIONS FOR ROOF BOLT BEARING PLATES

J. A. MCCORMICK, J. H. STEARS

INT-8MHS-30-13
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 832 FIELD 8G, 8D

EFFECT OF STRESS ON MICROSTRUCTURE

J. R. MCWILLIAMS, R. E. TWILL
R. J. WILLARD

INT-8M-6111531-5
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 837 FIELD 8G, 8D

USDI, BUR MINES, DENVER, COLORADO

RESIDUAL STRESS IN ROCK

L. OBERT

INT-8M-6111511-2
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 848 FIELD 8D, 8G

PRELIMINARY STUDIES OF FUNDAMENTALS OF ABRASION

O. TERICHOW, T. E. FINCH

INT-8M-6111531-13
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 851 FIELD 8G, 8D

USDI, BUR MINES, PITTSBURGH, PENNSYLVANIA

COAL BURSTS AND COAL MINE BUMPS

A. ZONA

INT-8MHS-30-19
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 870 FIELD 8D

USDI, BUR MINES, SAN FRANCISCO, CALIFORNIA

PRESSURE SATURATION CHARACTERISTICS OF FLOODED GAS SANDS

D. C. CROWELL, G. W. DEAN

INT-8M-611124100
/66- /

INTERIOR-BUREAU OF MINES

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ZUG 877 FIELD 8D, 8G

USDI, BUR MINES, BARTLESVILLE, OKLAHOMA

THERMAL TREATMENT FOR GAS STORAGE WELL DELIVERABILITY IMPROVEMENT

W. E. ECKARD, L. J. HEATH, R. V. HUFF

INT-8M-6-111211008
/66- /

INTERIOR-BUREAU OF MINES

09 ELECTRONICS AND ELECTRICAL ENGINEERING

****

GH 1763 FIELD 12A

USDC, NATL BUR STAN, DIST OF COLUMBIA

RESEARCH IN COMPUTER TECHNOLOGY AND DATA PROCESSING

* NONE

R-09-022-039
1/65- 6/66

NASA

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GH 1817 FIELD 12A

SYSTEMS DEVELOPMENT FOR CATALOGING AND FOR COMPUTER TAPE CONTROL OF CONFERENCES AND MONOGRAPHIC LITERATURE

J. C. WYLLIE, R. L. TOMLIN

NGR-47-005-036
5/65- 9/66

NASA

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GQF 3457 2 FIELD 9*,12A, 9D,20H

UNIV OF SOUTHERN CALIF, SCHOOL OF ENGINEERING, ELECTRICAL ENGINEERING, CALIFORNIA

OPTICAL COHERENCE

R. S. MACMILLAN

AF-AFOSR-0188-65
/65- /

DOD-AIR FORCE

****

GQF 3755 1 FIELD 12A

SOCIETY FOR INDUSTRIAL, + APPLIED MATH, PHILA, PENNSYLVANIA

SIAM JOURNAL ON CONTROL

I. E. BLOCK

AF-AFOSR-0527-64
/65- /

DOD-AIR FORCE

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ZON 530621 1 FIELD 15*, 9*,15D

NAVAL AIR DEVELOPMENT, PENNSYLVANIA

MICROELECTRONIC APPLICATIONS

J. WILLIS

/65- /

DOD-NAVY

****

ZON 544130 FIELD 9*, 9A,20L,20K

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

ANTENNA WIRE SUPPORT BOOM STUDIES

R. W. CHIU

/65- /

DOD-NAVY

****

ZON 544218 3 FIELD 20H, 9*, 9A,20L

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

SOLID STATE PHYSICS ELECTRONIC DEVICES

D. B. CLARK, R. D. MITCHCOCK

/65- /

DOD-NAVY

10 ENERGY CONVERSION (NON-PROPULSIVE)

****

ZON 531339 FIELD 7D, 7A, 9C, 9*

USN, BUR NAV WEAP, WHITE OAK, MARYLAND

FUEL CELL POWER GENERATION TECHNOLOGY

B. E. DRIMMER

/65- /

DOD-NAVY

****

ZON 544124 FIELD 15*, 9*, 9C

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

POWER SYSTEMS-UNINTERRUPTIBLE

E. GIORGI, E. W. WOLFF

/65- /

DOD-NAVY

****

ZON 544125 FIELD 9+, 9C, 9A

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

POWER LINE TRANSIENT ANALYSIS

H. H. KASIHARA, E. H. WOLFF

/65- /

DOD-NAVY

****

ZON 544158 FIELD 15+, 9+, 9C

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

UNINTERRUPTIBLE POWER EQUIPMENT

E. GIORGI, F. H. WOLFF

/65- /

DOD-NAVY

****

ZON 544202 FIELD 9C, 9+

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

POWER EQUIPMENT REPLACEMENT STUDY

R. D. SPENCER, C. E. PARKER

/65- /

DOD-NAVY

****

ZON 544209 FIELD 9+, 9C, 9A

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

POWER LINE TRANSIENT SUPPRESSION

S. J. WOOTEN

/65- /

DOD-NAVY

11 MATERIALS

****

ZQA 193 FIELD 11H,11F,11G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

INVESTIGATE MVTR-CORROSION RELATIONSHIP OF TRANSPARENT PLASTIC FILMS

L. LYNCH

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 197 FIELD 7C, 7D,11G,13H

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

IMPROVED CURATIVES FOR ELASTOMERS

J. WILLIAMS

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 199 FIELD 7C,11G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

IMPROVEMENTS IN ELASTOMER PERFORMANCE UNDER ARTIC ENVIRONMENTS

R. FADRO

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 200 FIELD 11G,11C,11F,15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

CONVERSION COATINGS FOR ALUMINUM FOR CORROSION RESISTANCE

J. KNANISHU

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 203 FIELD 11G,11H,11F

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

STUDY OIL SOLUBLE VOLATILE CORROSION INHIBITOR COMPOUNDS

R. JOHNSON

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 204 1 FIELD 9+, 9A,11C,11F

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

EFFECTS OF ORGANIC VAPORS ON ELECTRODEPOSITS

L. GILBERT

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 211 FIELD 7C,11B,11F,13H

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

ROLE OF ALUMINA IN ALUMINUM ALLOYS

R. MICLOT

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 218 FIELD 11G,11D,11H,11F

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

SELF LUBRICATING MATERIALS

G. MURPHY

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 221 FIELD 11H,11G,20D,15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

EFFECT OF CONTAMINANTS ON SHEAR STABILITY OF HYDRAULIC FLUIDS

R. LEMAR

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 223 FIELD 11H,13H,11F,11C

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

CONTACT ANGLE STUDY ON INHIBITION IN OIL METAL SYSTEMS

V. HONS

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 230 FIELD 7D, 7E

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

INVESTIGATION OF IRREVERSIBLE DESICCANTS

W. GARLAND

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQA 233 FIELD 7C,21I, 7D,11C

U. S. ARMY ORD. ARS., PENNSYLVANIA

BULK BEHAVIOR OF HETEROGENEOUS MATERIALS

K. M. SCHULGASSER

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQF 260011 FIELD 7D,11C,11F,13H

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

ULTRA-HIGH PURITY MATERIALS

A. F. ARMINGTON

/65- /

DOD-AIR FORCE

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ZQF 284897 FIELD 5A,11F,11G, 7D

USAF, AFSC, RTD, WRIGHT-PATT-AF MAT LAB, OHIO

DIFFUSION AND PHASE RELATIONSHIPS IN METALS AND ALLOYS

C. S. HARTLEY

/65- /

DOD-AIR FORCE

****

ZQN 544131 1 FIELD 11G,11D

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

DEGRADATION OF REINFORCED PLASTIC LAMINATES

T. ROE, W. S. HAYNES

/65- /

DOD-NAVY

****

ZQN 544146 FIELD 11B

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

CONCRETE STRAIN STUDIES WITH PHOTOELASTIC COATINGS

D. R. KEETON, D. F. GRIFFIN

/65- /

DOD-NAVY

****

ZQN 544147 FIELD 11C,11F,13H,11G

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

ADSORPTION OF POLYMERS ONTO STEEL SURFACES

J. B. CRILLY, W. S. HAYNES

/65- /

DOD-NAVY

****

ZQN 544149 FIELD 7D, 7A,11G,11C

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

MOISTURE TRANSMISSION THROUGH PROTECTIVE COATINGS

E. MATSUI, W. S. HAYNES

/65- /

DOD-NAVY

****

ZQN 544154 FIELD 11B,11F,20K

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

LONG RANGE OBSERVATIONS --SALT WATER CONCRETE

D. F. GRIFFIN, S. L. RUGG

/65- /

DOD-NAVY

****

ZQN 544155 6 FIELD 11C,11D,11F,11G

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

COOPERATIVE CORROSION STUDIES

C. V. BROUILLETTE

/65- /

DOD-NAVY

****

ZQN 544194 2 FIELD 11G,11C

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

CHEMICAL CLEANING MATERIALS AND PROCESSES

N. L. DROBNY, E. M. SOTELO

/65- /

DOD-NAVY

****

ZT 101 2 FIELD 7C,21B, 7B

TENN VALLEY AUTHORITY, TENNESSEE

FIRE RETARDANT TREATMENT OF WOOD

M. R. SIEGEL

/66- /

TENNESSEE VALLEY AUTHORITY

****

ZUG 785 FIELD 13H,13I

DEPT. INTERIOR, BUR., .., PENNSYLVANIA

STEELMAKING RESEARCH

N. B. MELCHER, R. T. COULEHAN, M. EVAN E. G. ILLIG, W. M. MAHAR, J. P. MORRIS J. P. RIOTT

INT-BM-111431-6
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 786 FIELD 11G,11F,13H

USDI, BUR MINES, MINNEAPOLIS, MINNESOTA

BLAST SMELTING OF COPPER CONCENTRATES

N. B. MELCHER, M. M. FINE, L. M. IRWIN J. L. REUSS

INT-BM-111431-8
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 787 FIELD 11G,11F,13H

USDI, BUR MINES, MINNEAPOLIS, MINNESOTA

PREPARATION OF PREREDUCED AND OXIDIZED IRON ORE PELLETS

N. B. MELCHER, N. BERNSTEIN, M. M. FINE J. L. REUSS, R. B. SCHLUTER

INT-BM-111431-9
/66- /

INTERIOR-BUREAU OF MINES

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ZUG 788 FIELD 11F,13H

USDI, BUR MINES, MINNEAPOLIS, MINNESOTA

CONCENTRATION OF IRON-BEARING ORES BY MIGRATION AND CONSOLIDATION OF METALLIC IRON

N. B. MELCHER, M. M. FINE

INT-BM-111431-3
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 791 FIELD 11C,11F,13H,11G

USDI, BUR MINES, ROLLA, MISSOURI

ALUMINUM COATING OF STEEL

H. KENWORTHY, F. W. HUERTEL A. G. STARLIPER

INT-BM-111451-16
/66- /

INTERIOR-BUREAU OF MINES

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ZUG 794 FIELD 13H

USDI, BUR MINES, ALBANY, OREGON

PYROMETALLURGICAL PROCESSING OF LOW-GRADE SCRAP

A. H. ROBERSON, L. H. BANNING W. L. HUNTER, S. C. RHOADS

INT-BM-111411-COMP28
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 795 FIELD 11F,13H

USDI, BUR MINES, ALBANY, OREGON

STEEL FROM AUTOMOBILE SCRAP AND DIRECTLY REDUCED ORE

A. H. ROBERSON, L. H. BANNING G. W. ELGEM, A. D. FUGATE

INT-BM-111411-COMP27
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 797 FIELD 7C, 7D, 7A,11F

USDI, BUR MINES, MINNEAPOLIS, MINNESOTA

KINETICS AND MECHANISMS OF METALLURGICAL REACTIONS

N. B. MELCHER, E. F. FOERSTER, L. A. HAAS S. E. KHALAFALLA, S. L. PAYNE T. N. RUSHTON, P. L. WESTON

INT-BM-111431-4
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 800 FIELD 11F,13H,12A,11G

USDI, BUR MINES, COLLEGE PK, MARYLAND

MATHEMATICAL SIMULATION OF METALLURGICAL PROCESSES

F. D. LAMB, H. W. STCLAIR

INT-BM-111421-20
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 810 FIELD 11F,13H

USDI, BUR MINES, S.L.C., UTAH

CHEMICAL PROCESSING OF FERROUS SCRAP

B. H. CLEMMONS, J. P. BAUR, H. DOLEZAL S. L. MAY, C. H. SCHACK

INT-BM-111461-13
/66- /

INTERIOR-BUREAU OF MINES

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ZUG 872 FIELD 7D, 8D, 8G,11B

USDI, BUR MINES, TUSCALOOSA, ALABAMA

BENEFICIATION OF KYANITE ORES

F. J. CSERVENYAK, J. S. BROWNING

INT-BM-111471-6
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 880 FIELD 7C,21B,21D, 7D

AUTOIGNITION TEMPERATURES OF A NEW ENGINE LUBRICANT AT REDUCED AND ELEVATED PRESSURES

J. M. KUCHTA

INT-BM-4417
/65- /

INTERIOR-BUREAU OF MINES

****

ZUG 883 FIELD 11F, 7B

USDI, BUR MINES, COLLEGE PK, MARYLAND

CORROSION PROPERTIES OF REFRACTORY METALS

F. D. LAMB, C. B. KENAHAN, D. SCHLAIN

INT-BM-111421-11
/66- /

INTERIOR-BUREAU OF MINES

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ZYA 32236 FIELD 7C, 7B

USDA, OLUSTEE, FLORIDA

PINE GUM DERIV. FOR USE IN POLYURETHANE ELASTOMERS AND FOAMS

G. W. HEDRICK

AG-SOS-02-056
/66- /

AGRICULTURE-DEPT OF AGRICULTURE

12 MATHEMATICAL SCIENCES

****

3H 518 1 FIELD 12A

IOWA ST UNIV SCI TECH, GRADUATE SCHOOL, PHYSICS, IOWA

INVESTIGATION OF HYPERGEOMETRIC FUNCTIONS AND ELLIPTIC INTEGRALS

B. C. CARLSON

NASA-NSG-293-P-3
1/64-12/64

NASA

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GQF 325 6 FIELD 12A,20J

YALE UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, CONNECTICUT

FUNCTIONAL EQUATIONS AND SPECTRAL OPERATORS

C. E. RICKART

AF-AFOSR-0407-63
/65- /

DOD-AIR FORCE

****

GQF 793 7 FIELD 12A

HEBREW UNIVERSITY, ISRAEL

TOPICS IN MATHEMATICAL ANALYSIS

S. AGMON

AF-EOAR-0027-65
/65- /

DOD-AIR FORCE

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GQF 2637 4 FIELD 12A,20M,20J

UNIV OF BRITISH COL, GRADUATE SCHOOL, CANADA

SPECTRAL PROBLEMS FOR ELLIPTIC OPERATORS

C. A. SWANSON

AF-AFOSR-0379-65
/65- /

DOD-AIR FORCE

13 MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

****

7GX 554 4 FIELD 13B

UNIVERSITY OF MICHIGAN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MICHIGAN

SAND FILTRATION OF DISCRETE SUSPENSIONS

J. A. BORCHARDT

7-WP-00329-04
12/65-11/66

PHS-BSS

****

7GX 1247 2 FIELD 13B

ILLINOIS INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, ILLINOIS

FOAM SEPARATION - FLOTATION OF COLLOID-ORGANIC SYSTEMS

R. B. GRIEVES, C. F. GURNHAM

ESE 47WP-00702-02)
1/66-12/66

PHS-BSS

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7GX 1598 2 FIELD 13B, 7D, 7B

MANHATTAN COLLEGE, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, NEW YORK

PREVENTION OF CHROMATE POLLUTION BY ELECTRODIALYSIS

J. B. FARRELL, P. K. MURPHY

7-WP-00742-02
10/65- 9/66

PHS-BSS

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7ZX 204 3 FIELD 7C, 7D,20J

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

SEPARATION TECHNIQUES ON ORGANIC PARTICULATES

E. SAWICKI, E. D. BARBER, S. P. MCPHERSON T. W. STANLEY

BSS-B-2-3
/66- /

PHS-BSS

****

7ZX 210 3 FIELD 13A,10B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

ENGINE MODIFICATION STUDIES

R. C. STAHMAN, D. M. HOLLABAUGH H. W. NORTH, R. E. KRUSE, W. F. MCMICHAEL

BSS-B-1-7
/66- /

PHS-BSS

****

7ZX 213 3 FIELD 13A, 7C, 7D,10B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

AUTO EXHAUST STUDIES

J. E. SIGSBY, T. A. BELLAR

BSS-B-2-8
/66- /

PHS-BSS

****

7ZX 214 3 FIELD 13A, 7C, 7D, 7A

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

IRRADIATION CHAMBER STUDIES

J. E. SIGSBY, P. W. LEACH

BSS-B-2-7
/66- /

PHS-BSS

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7ZX 215 3 FIELD 13A, 7C, 7D

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

SEPARATION TECHNIQUES ON GASES AND VAPORS

B. E. SALTZMAN, A. P. ALTSHULLER C. A. CLEMONS

BSS-B-2-6
/66- /

PHS-BSS

****

7ZX 216 3 FIELD 13A, 7D, 7A, 7B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

ANALYTICAL METHODOLOGY ON GASES AND VAPORS

B. E. SALTZMAN, A. F. WARTBURG

BSS-B-2-5
/66- /

PHS-BSS

****

7ZX 224 3 FIELD 13A,13B, 7B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

CONTINOUS AIR MONITORING PROJECT

G. A. JUTZE, L. DUNN, D. M. FAIR P. KOLOS, R. J. LEWIS

BSS-B-4-3
/66- /

PHS-BSS

****

7ZX 226 3 FIELD 4B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

NATIONAL AIR SAMPLING NETWORK

E. C. YABOR, N. A. HUEY, C. D. ROBSON

BSS-B-4-1
/66- /

PHS-BSS

****

7ZX 227 3 FIELD 13A, 7C, 7D, 4B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

INTERRELATIONSHIPS OF METEOROLOGICAL ELEMENTS AND AIR QUALITY

J. F. CLARKE

BSS-B-5-4
/66- /

PHS-BSS

****

7ZX 228 3 FIELD 4B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

THE CLIMATOLOGY OF METEOROLOGICAL FACTORS AFFECTING THE TRANSPORT AND DISPERSION OF ATMOSPHERIC POLLUTANTS

G. HOLZWORTH

BSS-B-5-3
/66- /

PHS-BSS

****

7ZX 229 3 FIELD 13A,13B, 4A

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

FORECASTING AIR POLLUTION POTENTIAL

L. E. NIEMEYER, J. F. CLARKE A. S. KUSSMAN

BSS-B-5-1
/66- /

PHS-BSS

****

7ZX 231 3 FIELD 13A,13B, 4B

USDC, WEATH BUR, DIST OF COLUMBIA

INTRA-AND INTER-URBAN TRANSPORT AND DIFFUSION OF AIR POLLUTION

D. M. PACK, F. POOLER

BSS-B-5-2
/66- /

PHS-BSS

****

7ZX 244 3 FIELD 13A,13B, 4B, 6B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

EVALUATION OF SAMPLING METHODS

F. B. BENSON

BSS--C-7-1
/66- /

PHS-BSS

****

7ZX 246 3 FIELD 13A,13B, 8D, 7B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

DEVELOPMENT OF ANALYTICAL PROCEDURES FOR AIR CONTAMINANTS

T. R. HAUSER

BSS-C-7-2
/66- /

PHS-BSS

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7ZX 254 3 FIELD 13B, 4B,12A

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

SEWARD-NEW FLORENCE AIR POLLUTION STUDY

R. J. HORTON, J. *. HORTON, F. MASSEY

BSS-C-1-7
/66- /

PHS-BSS

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7ZX 266 3 FIELD 13A, 8D, 4B,11F

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

INTERSTATE AIR POLLUTION STUDY - ST. LOUIS-EAST ST. LOUIS METROPOLITAN AREA

J. D. WILLIAMS, W. N. JENKINS
D. S. MATHEWS, F. PARTEE, L. RING
J. W. SADLER, J. P. SPERBER

BSS-D-2-64
/6A- /

PHS-BSS

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7ZX 276 3 FIELD 13A,10B

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

REMOVAL OF SO2 FROM COMBUSTION EFFLUENTS

P. W. SPAITE, W. F. TODD

BSS-9-1-5
/66- /

PHS-BSS

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GQA 14 FIELD 10B

SIMULATED OCCUPANCY EXPERIMENTS

F. M. FLANIGAN, J. O. GONZALEZ

8-64225-4949A-17-US
/65- /

DOD-ARMY

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GQA 20

STANFORD RESEARCH INST, MENLO PARK, CALIFORNIA

SUMMARY OF CIVIL DEFENSE REQUIREMENTS FOR BLAST PROTECTION

E. G. CHILTON

OCD-PS-64-201
/65- /

DOD-ARMY

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GQA 22 1 FIELD 12A,20K

STANFORD RESEARCH INST, MENLO PARK, CALIFORNIA

LOW-COST TECHNIQUES FOR UPGRADING BLAST PROTECTION OF FALLOUT SHELTERS

R. I. CONDIT

OCD-PS-64-201
/65- /

DOD-ARMY

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ZQA 31 FIELD 11B,11C,11F,11G

USA, ORD CORPS, WATERVLIET ARSNL, NEW YORK

ELECTRODEPOSITION OF DISPERSION-HARDENED ALLOYS

F. SAUTTER

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 231 FIELD 11G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

EVALUATION OF NEW PACKAGING MATERIALS AND METHODS

G. MARTIN

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 249 FIELD 20K

STATIC TESTING OF STRUCTURAL ELEMENTS AND SYSTEMS

M. M. DEMBO

OCD-PS-65-17
/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQN 544075 FIELD 13G,13B

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

DISTRIBUTION OF LIQUIDS IN POLAR CAMPS

C. R. HOFFMAN, E. H. MOSER

/65- /

DOD-NAVY

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ZQN 544077 FIELD 15G

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

SNOW TUNNEL WALL MAINTENANCE EQUIPMENT

S. E. GIFFORD

/65- /

DOD-NAVY

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ZQN 544078 FIELD 13J,13F,10B,15G

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

FLOODING EQUIPMENT

C. R. HOFFMAN, E. H. MOSER

/65- /

DOD-NAVY

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ZQN 544085

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

TECHNICAL PROGRESS SURVEY OF POLAR ENGINEERING AND CONSTRUCTION

R. C. COFFIN, E. H. MOSER

/65- /

DOD-NAVY

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ZQN 544086 FIELD 15C,15G

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

ADVANCED PLANNING POLAR

E. H. MOSER, R. C. COFFIN

/65- /

DOD-NAVY

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ZQN 544098 FIELD 13J,13G

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

LIGHT DUTY GROUND ANCHORS

P. A. DANTZ

/65- /

DOD-NAVY

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ZQN 544099 FIELD 13B,20K

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

ANCHORAGES IN VARIOUS SOIL MEDIUMS

R. J. SMITH

/65- /

DOD-NAVY

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ZQN 544100 FIELD 13B

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

LATERAL PLATE TESTS

W. L. GILL

/65- /

DOD-NAVY

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ZQN 544103 FIELD 13B

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

MINIMUM WATER SANITARY SYSTEM

W. R. NEHLSEN

/65- /

DOD-NAVY

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ZQN 544114 FIELD 21B, 7D

STUDIES OF FOAM

R. L. TUVE, W. B. PETERSON

/65- /

DOD-NAVY

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ZON 544117 FIELD 15+, 9+,15G

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

FIXED AND REEL TYPE CO2 SYSTEMS

C. W. TERRY

/65- /

DOD-NAVY

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ZON 544122 FIELD 8H,15G

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

STUDY OF POTABLE WATER IN PROBLEM AREAS

W. P. NEHLSEN

/65- /

DOD-NAVY

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ZON 544129 FIELD 13G,11L

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

WATERFRONT STRUCTURES + WRAPPING OF PILES

T. ROF, W. S. HAYNES

/65- /

DOD-NAVY

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ZON 544136 3 FIELD 13J,20K

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

STRUCTURES IN DEEP OCEAN + MECHANICS OF PLACING AND RECOVERING HEAVY LOADS IN DEEP OCEAN WATER

B. J. MUGA, J. J. HROMADIK

/65- /

DOD-NAVY

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ZON 544174 4 FIELD 13J, 8H

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

DEEP OCEAN ANCHORAGES

B. E. SMITH, P. A. DANTZ

/65- /

DOD-NAVY

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ZON 544176 FIELD 13J

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

STRUCTURES IN DEEP OCEAN + DEEP OCEAN MANUAL FOR THE COMPLETION OF CHAPTER 7

J. E. SMITH, J. J. HROMADIK

/65- /

DOD-NAVY

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ZON 544196 FIELD 13J,10B

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

SHIFTING BALLAST IN A ROLLING UNIT AS A MEANS OF LOCOMOTION FOR A DEEP OCEAN VEHICLE

C. HERNDON, R. E. JOCHUMS

/65- /

DOD-NAVY

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ZON 544201 1 FIELD 11F,20D,10B

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

INVESTIGATION OF FILM EVAPORATION ON THE OUTSIDE OF HORIZONTAL TUBES

J. S. WICLIAMS, E. H. WOLFF

/65- /

DOD-NAVY

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ZON 544204 1

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

STAFFING CRITERIA FOR CONSTRUCTION INSPECTION PERSONNEL

H. A. LEUPP

/65- /

DOD-NAVY

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ZUA 11 3 FIELD 13B,12A, 8E

USDI, GEOL SURV, DIST OF COLUMBIA

DIRECT GEODETIC CONSTRAINT METHOD OF ANALYTICAL AEROTRAINGULATION

R. C. ELLER

50-01
/66- /

INTERIOR-GEOLOGICAL SURVEY

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ZUE 2 FIELD 7A, 7D,20M,11G

US, AEC, ORNL, ONAL LAB, TENNESSEE

WATER RESEARCH PROGRAM

K. A. KRAUSE

/66- /

INTERIOR-OFFICE OF SALINE WATER

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ZUG 846 FIELD 8D, 5A

MATERIALS HANDLING + PHYSICAL PROPERTIES AND FLOW MECHANISMS

C. J. STEHLIK, R. S. FOWKES
G. A. WANCHECK

INT-BM-6111541-1
/66- /

INTERIOR-BUREAU OF MINES

14 METHODS AND EQUIPMENT

****

GH 1845 FIELD 12A

USN, OFF NAV RES, NAV RES LAB, DIST OF COLUMBIA

PARTICIPATION IN INTER-AGENCY PROGRAM IN STATISTICAL QUALITY CONTROL AND RELIABILITY

+ NONE

R-128
7/65- 6/66

NASA

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GPE 1147 FIELD 6B, 9+,11G, 5A

CATHOLIC UNIV OF AMER, GRADUATE SCHOOL, PHYSICS, DIST OF COLUMBIA

DETECTOR DEVELOPMENT

C. L. COWAN

AT(30-1)2419
6/65- 8/66

AEC-BIOLOGY + MEDICINE

****

ZOF 420550 FIELD 6B,13+, 9+, 9A

USAF, ARNOLD AFS, TENNESSEE

DEVELOPMENT OF HYPERVELOCITY FORCE MEASURING SYSTEM

R. L. LEDFORD

AF-40-600-1000
/65- /

DOD-AIR FORCE

15 MILITARY SCIENCES

****

ZOA 216 FIELD 15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

ARTILLERY CONSULTING

R. H. COBERLY

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZON 543009 FIELD 15G

APPLICATION OF READINESS CRITERIA TO ALLOWANCE LISTS + VALIDATION

K. H. RANDOLPH

/65- /

DOD-NAVY

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ZON 544101 FIELD 13F

USN, RUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

ANTARCTIC SURFACE TRANSPORTATION ANALYSIS

S. E. GIFFORD, E. H. MOSER

/65- /

DOD-NAVY

16 MISSILE TECHNOLOGY

****

ZON 530571 FIELD 20D,10B

USN, RUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

MISSILE ROLL RATE CHARACTERISTICS WIND TUNNEL INVESTIGATION

R. BROBERG

/65- /

DOD-NAVY

18 NUCLEAR SCIENCE AND TECHNOLOGY

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70X 2196 4 FIELD 5A,18A

FRANKLIN + MARSHALL, UNDERGRADUATE SCHOOL, PHYSICS, PENNSYLVANIA

ENVIRONMENTAL RADIOACTIVITY

R. I. WELLER

7-RH-00366-04
6/65- 5/66

PHS-BSS

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7ZX 455 3 FIELD 7D,20H, 5A,18A

USDHEW BSS ENGIN CTR, SANI ENG CTR,CINCINNAT, OHIO

DEVELOPMENT OF METHODS FOR THE IDENTIFICATION AND CALIBRATION OF RADIONUCLIDES IN ENVIRONMENTAL AND BIOLOGICAL MEDIA

H. E. KOLDE, G. J. KARCHES, R. J. VELTEN T. B. YEAGER

BSS-415-04-1
/66- /

PHS-BSS

19 ORDNANCE

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GQF 438 6 FIELD 7C,19D, 7A, 7C

ELECTRICAL AND PLASMA PHENOMENA ACCOMPANYING DETONATIONS

M. A. COOK, R. T. KEYES

AF-AFOSR-3056-65
/65- /

DOD-AIR FORCE

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ZQA 157 2 FIELD 15G

USA, ORD CORPS, WATERTOWN ARSNL, MASSACHUSETTS

HYPER VELOCITY IMPACT

C. RIDDLE

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 158 FIELD 19+

USA, ORD CORPS, SPRINGFIELD ARM, MASSACHUSETTS

SILENCER STUDIES AND FLASH SUPPRESSION FOR SMALL ARMS

J. KWOLEK, J. ONEIL, W. WATLING

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 195 FIELD 15C,15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

CONCEPT + FEASIBILITY STUDIES OF HYPERMOBILE ARTILLERY

W. E. HEIDEL, R. SPROTT

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 196 FIELD 15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

CONCEPT + FEASIBILITY STUDIES ON AUTOMATION OF ARTILLERY WEAPONS

S. C. THODOS

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 212 1 FIELD 15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

ENGINEER + DEVELOPMENT OF RESERVOIR + MULTI-BAFFLE TYPE MUZZLE BRAKE

M. J. SALSBURY

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 213 FIELD 15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

CONCEPT STUDIES FOR NEW COMPONENTS + SYSTEMS FOR ARTILLERY WEAPONS

W. W. WELLS, H. A. WIESE

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 214 FIELD 12A,15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

DESIGN + ANALYSIS OF A FUNCTION CONTROL ROD

R. H. COFFRLY

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 215 FIELD 12A, 5C,15C,15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

ANALYSIS + SIMULATION OF CARRIAGE DYNAMICS

R. H. COBERLY

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 217 FIELD 15G

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

FEASIBILITY AND DESIGN STUDIES ON 105MM RAPID FIRE WEAPON SYSTEM

C. R. SHAFFER, J. COPPERSMITH

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

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ZQA 229 FIELD 11G,19+,15C

USA, ORD CORPS, ROCK ISL ARSNL, ILLINOIS

RESEARCH RELATED TO IMPROVED SILHOUETTE TARGET MATERIAL

A. C. SAUNDERS

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

20 PHYSICS

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GQF 6525 1 FIELD 5A,20I

UNIV OF CAL-L. A., GRADUATE SCHOOL, PHYSICS, CALIFORNIA

PLASMA DYNAMICS AND INTERACTIONS WITH HIGH FREQUENCY FIELDS

K. R. MACKENZIE

AF-AFOSR-0567-64
/65- /

DOD-AIR FORCE

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GQF 6701 1 FIELD 20F,20I

AEROJET-GEN NUCLEONICS, SAN RAMON, CALIFORNIA

UNSTABLE OSCILLATIONS IN ENERGETIC ARCS

C. P. KRETSCHMER

AF-49-638-01548
/65- /

DOD-AIR FORCE

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GQF 6727 1 FIELD 11G,20F,20L

SOUTHERN ILLINOIS UNIV, GRADUATE SCHOOL, ILLINOIS

SINGLE CRYSTALS UNDER THERMAL GRADIENTS

J. L. AMOROS

AF-AFOSR-0596-64
/65- /

DOD-AIR FORCE

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GQF 6731 1 FIELD 20D

MASS INST OF TECHNOL, SCHOOL OF ENGINEERING, AERONAUT + ASTRONAUT, MASSACHUSETTS

WAKE STUDIES USING MAGNETIC SUSPENSION

M. FINSTON

AF-49-638-01328
/65- /

DOD-AIR FORCE

****

GQF 6744 1 FIELD 11G,20L

UNIV OF TEXAS, AUSTIN, SCHOOL OF ENGINEERING, ENGINEERING MECHANICS, TEXAS

MECHANISM OF FATIGUE IN METALLIC CRYSTALS

M. A. WILKOV

AF-AFOSR-0560-65
/65- /

DOD-AIR FORCE

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GQF 6758 1 FIELD 20M, 5A,20L, 7B

POLYTECH INST BROOKLYN, GRADUATE SCHOOL, PHYSICS, NEW YORK

SURFACE PROPERTIES BY SLOW ELECTRON DIFFRACTION

R. H. STERN

AF-49-638-01369
/65- /

DOD-AIR FORCE

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GOF 6788 1 FIELD 5A,20L, 7B

UNIVERSITY OF IDAHO, GRADUATE SCHOOL, PHYSICS, IDAHO

COLOR CENTERS IN SINGLE CRYSTALS OF THE ALKALINE EARTH OXIDES

E. F. SIECKMANN

AF-AFOSR-0634-64
/65- /

DOD-AIR FORCE

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GOF 6797 1 FIELD 12A,20H,20L

PHYSICS ENGR CHEM INC, BOULDER, COLORADO

COMPUTER EVALUATION OF THE CHARACTERS OF THE SPACE GROUPS

S. C. MILLER

AF-49-638-01394
/65- /

DOD-AIR FORCE

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GOF 6834 1 FIELD 20D

UNIVERSITY OF OKLAHOMA, SCHOOL OF ENGINEERING, ENGINEERING, OKLAHOMA

A UNIFIED APPROACH TO TRANSPORT PHENOMENA BASED ON ENGINEERING THERMODYNAMICS

C. M. SLIEPCEVICH

AF-AFOSR-0563-65
/65- /

DOD-AIR FORCE

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GOF 6838 1 FIELD 20I

INTERACTION OF PLASMA STREAMS WITH MAGNETIC FIELDS

J. M. SELLEN

AF-49-638-01538
/65- /

DOD-AIR FORCE

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GOF 6845 1 FIELD 12A,20J,20I

RELAXATION TIMES OF A DILUTE PLASMA

R. S. ONG

AF-AFOSR-0825-65
/65- /

DOD-AIR FORCE

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GOF 14143 FIELD 20L

UNIV OF TORONTO, GRADUATE SCHOOL, CANADA

INVESTIGATION OF HALL-CURRENT ACCELERATION

R. M. MEASURES

AF-AFOSR-0944-65
/65- /

DOD-AIR FORCE

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GOF 19941 FIELD 11R

MELLON INST OF INDUS, PENNSYLVANIA

DEFECT STATES AND STRUCTURES OF OXIDE GLASSES

J. H. MACKEY

AF-AFOSR-0974-66
/65- /

DOD-AIR FORCE

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GOF 20097 FIELD 20L,20D,20K

CASE INST OF TECHNOL, SCHOOL OF ENGINEERING, ENGINEERING, OHIO

TIME-DEPENDENT HYPERSONIC VISCOUS INTERACTIONS

E. RESHOTKO

AF-AFOSR-0954-65
/65- /

DOD-AIR FORCE

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GOF 20137 FIELD 20F,20I,20A

UNIV OF CAL-L. A., GRADUATE SCHOOL, CALIFORNIA

JOINT EXPERIMENTAL AND THEORETICAL INVESTIGATIONS IN PLASMA PHYSICS

A. Y. WONG

AF-AFOSR-0962-65
/65- /

DOD-AIR FORCE

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GOF 207070 2 FIELD 20D,10R

HYPERSONIC AEROTHERMODYNAMIC SIMULATION IN RAREFIED FLOWS

S. L. PETRIE

AF-33-657-11060
/65- /

DOD-AIR FORCE

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GOF 207087 4 FIELD 20D

PRINCETON UNIVERSITY, SCHOOL OF ENGINEERING, AEROSPACE + MECH SCI, NEW JERSEY

HYPERSONIC FLOW RESEARCH

S. M. BOGDONOFF

AF-33-615-01079
/65- /

DOD-AIR FORCE

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GOF 207088 5 FIELD 20D

HYPERSONIC RAREFIED VISCOUS FLOW PHENOMENA NON-EQUILIBRIUM FLOW MAGNETOHYDRODYNAMICS AT EXTREMELY HIGH MACH NOS AND TEMPERATURES

M. GLICK

AF-33-615-01080
/65- /

DOD-AIR FORCE

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GOF 207117 4 FIELD 20L,20D

BROWN UNIVERSITY, GRADUATE SCHOOL, ENGINEERING, RHODE ISLAND

EFFECTS OF FREE STREAM TURBULENCE + OSCILLATIONS ON HEAT TRANSFER AND SURFACE DRAG

J. KESTIN

AF-33-615-01263
/65- /

DOD-AIR FORCE

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GOF 207129 3 FIELD 20I

DARTMOUTH COLLEGE, GRADUATE SCHOOL, NEW HAMPSHIRE

INTERACTIONS BETWEEN ELECTRIC ARC + GAS FLOWS IN THE ANODE SHEATH REGION

P. RUNSTADLER

AF-33-657-08179
/65- /

DOD-AIR FORCE

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GOF 207134 3 FIELD 20D,20K

UNIVERSITY OF MICHIGAN, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, MICHIGAN

INFLUENCE OF SURFACE OSCILLATIONS ON BOUNDARY LAYER FLOWS

J. A. CLARK

AF-33-657-08368
/65- /

DOD-AIR FORCE

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GOF 207135 4 FIELD 20M,20I,20D, 7B

AVCO MFG CORP WILMIN, MASSACHUSETTS

RADIATION FROM ARC HEATED PLASMAS

J. MORRIS

AF-33-615-02976
/65- /

DOD-AIR FORCE

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GOF 207143 2 FIELD 20D

PRINCETON UNIVERSITY, SCHOOL OF ENGINEERING, AEROSPACE + MECH SCI, NEW JERSEY

LAMINAR MIXING AND HEAT TRANSFER OF AN IONIZED GAS AND A GASEOUS COOLANT

J. GREY

AF-33-657-09962
/65- /

DOD-AIR FORCE

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GOF 207149 1 FIELD 20D,20K

MIDWEST RES INST KAN, MISSOURI

EXPERIMENTS ON CIRCULAR CYLINDER PANEL FLUTTER

R. O. STEARMAN

AF-33-615-01740
/65- /

DOD-AIR FORCE

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GOF 207157 3 FIELD 20D

ISR INST OF TECHNOLOGY, ISRAEL

THEORY FOR SUPERSONIC TWO DIMENSIONAL LAMINAR BASE TYPE FLOWS USING THE CROCCO LEES MIXING CONCEPTS

J. ROM

AF-61-052-00576
/65-

DOD-AIR FORCE

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GOF 207158 1 FIELD 20F,20I, 7B

TECH HIGH SCH AACHEN, GERMANY

ANALYTICAL STUDIES OF ARC DISCHARGE PHENOMENA

I. M. FUCKS

AF-61-052-00905
/65- /

DOD-AIR FORCE

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GGF 207330 1 FIELD 20M,20L, 7B

MARQUETTE UNIVERSITY, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, WISCONSIN

DEFECT CONTROLLED ELECTRICAL PROPERTIES OF RUTILE

W. M. HIRTHE

AF-33-615-01244
/65- /

DOD-AIR FORCE

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GGF 207311 2 FIELD 5A,20J

NORTHEASTERN UNIV, GRADUATE SCHOOL, PHYSICS, MASSACHUSETTS

ELEMENTARY PARTICLES AND RELATIVITY THEORY

R. L. ARNOWITT

AF-33-657-10161
/65- /

DOD-AIR FORCE

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GGF 207313 4 FIELD 12A,20M, 5A,20J

STEVENS INST OF TECH, GRADUATE SCHOOL, PHYSICS, NEW JERSEY

PROBLEMS RELATING QUANTUM THEORY TO THE GENERAL THEORY OF RELATIVITY

R. SCHILLER

AF-33-657-11558
/65- /

DOD-AIR FORCE

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GGF 207320 3 FIELD 3C,12A, 8E,20M

UNIV OF HAMBURG, GERMANY

MATHEMATICAL PROBLEMS OF GENERAL RELATIVITY AND ELEMENTARY PARTICLES

P. JORDAN

AF-61-052-00567
/65- /

DOD-AIR FORCE

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GGF 207334 1 FIELD 20L,20D

DYNAMIC SCIENCES CORP, SOUTH PASADENA, CALIFORNIA

ANALYTICAL STUDY OF PARTICLE-FLUID FLOWS IN EXPANDING CURVED DUCTS

M. GERSTEIN

AF-33-615-01040
/65- /

DOD-AIR FORCE

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GGF 207335 1 FIELD 20D

RSCH INVESTIGATION ON THE SEPARATION OF SOLID PARTICLES FROM A SWIRLING FLUID FLOW

J. D. LEE

AF-33-615-01063
/65- /

DOD-AIR FORCE

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GGF 207344 3 FIELD 7D, 7A,20M, 9C

UNIVERSITY OF MICHIGAN, SCHOOL OF ENGINEERING, AERONAUT & ASTRONAUT, MICHIGAN

RESEARCH STUDY OF CONDENSATION PHENOMENA RELATED TO VAPORS IN EXPANDING GASES

P. M. SHERMAN

AF-33-615-02307
/65- /

DOD-AIR FORCE

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GGF 207357 4 FIELD 20M,20J, 5A,20F

OPTICAL PROPERTIES OF SEMICONDUCTING SINGLE CRYSTALS

W. R. RAMBAUSKE

AF-33-615-01257
/65- /

DOD-AIR FORCE

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GGF 207362 3 FIELD 20M,20F,20L, 7B

CRYOPHYSICAL RESEARCH ON CDS

J. G. DAUNT

AF-33-657-08973
/65- /

DOD-AIR FORCE

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GGF 207363 3 FIELD 9A, 9A,20J,20L

BROWN UNIVERSITY, GRADUATE SCHOOL, ENGINEERING, RHODE ISLAND

STUDIES OF RADIATION EFFECTS IN SEMICONDUCTORS

J. J. LOFERSKI

AF-33-615-02310
/65- /

DOD-AIR FORCE

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GGF 207368 6 FIELD 5A,20L

UNIV OF WISCONSIN, GRADUATE SCHOOL, PHYSICS, WISCONSIN

ENERGY LEVELS IN SEMICONDUCTOR MATERIALS THRU CYCLOTRON RESONANCE

R. N. DEXTER

AF-33-657-11515
/65- /

DOD-AIR FORCE

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GGF 207377 5 FIELD 7B

ILLINOIS INST OF TECH, GRADUATE SCHOOL, ILLINOIS

PHASE EQUILIBRIA STUDIES IN THE ZRO-2-SC203 SYSTEM

R. F. DOMAGALA

AF-33-615-01486
/65- /

DOD-AIR FORCE

****

GGF 207386 5 FIELD 20J

UNIV OF UPPSALA, SWEDEN

QUANTUM THEORY OF MANY-PARTICLE SYSTEMS

P. O. LOWDIN

AF-61-052-00701
/65- /

DOD-AIR FORCE

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GGF 207387 [illegible] FIELD 20D,20I

AVCO MFG CORP WILMIN, MASSACHUSETTS

INVESTIGATION OF GAS ACCELERATION THROUGH INTERACTION OF ELECTRIC DISCHARGES WITH PRE-IONIZED GASES AND MAGNETIC FIELDS

A. MALLIARIS

AF-33-657-11310
/65- /

DOD-AIR FORCE

****

GGF 207409 FIELD 5A,20F,20I

UNIV OF SOUTHERN CALIF, GRADUATE SCHOOL, PHYSICS, CALIFORNIA

ARC PLASMA DIAGNOSTICS WITH VACUUM ULTRAVIOLET RADIATION

G. L. WEISSLER

AF-33-615-02395
/65- /

DOD-AIR FORCE

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GGF 207410 FIELD 20I

EXPLORATORY FUNCTIONS FOR THE DETERMINATION OF THE PARTICLE DISTRIBUTION FUNCTIONS IN PLASMAS

I. P. SHKAROFSKY

AF-33-615-02196
/65- /

DOD-AIR FORCE

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GGF 207413 FIELD 20D

UNIVERSITY OF MICHIGAN, GRADUATE SCHOOL, MICHIGAN

EFFECTS OF WIND TUNNEL TURBULENCE ON BOUNDARY-LAYER TRANSITION AT MACH NUMBER 8.0

J. L. AMICK

AF-33-615-/2407
/65- /

DOD-AIR FORCE

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GGF 207418 2 FIELD 20D,10B

VON KARMAN INST FL DYN, BELGIUM

INVESTIGATION ON BLUNT TRAILING EDGE BLADINGS FOR USE IN SUPERSONIC COMPRESSORS

J. CHAUVIN

AF-EOAR-0065-65
/65- /

DOD-AIR FORCE

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GGF 207423 FIELD 7D,14E,20M,11D

OHIO STATE UNIVERSITY, GRADUATE SCHOOL, OHIO

LOW TEMPERATURE THERMAL EXPANSION OF WURTZITE-PHASES OF II B-VI B COMPOUNDS

R. R. REEBER

AF-33-615-02270
/65- /

DOD-AIR FORCE

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GGF 207439 FIELD 20D,13E

NORTHERN RES ENGR CORP, CAMBRIDGE, MASSACHUSETTS

BASIC RESEARCH ON THE INVESTIGATION OF A TWO-COMPONENT HEAT TRANSFER

R. W. BILGER

AF-33-615-02340
/65- /

DOD-AIR FORCE

****

GOF 207477 FIELD 20D,20K, 5A

PRINCETON UNIVERSITY, GRADUATE SCHOOL, PHYSICS, NEW JERSEY

HIGH SPEED GAS DYNAMICS

S. M. BOGDONOFF

AF-49-638-01271
/65- /

DOD-AIR FORCE

****

GOF 207478 FIELD 20D,20L, 7B

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

ELECTRON BEAM INTERACTIONS ON SURFACES

T. HAAS

/65- /

DOD-AIR FORCE

****

GOF 207488 FIELD 20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

HEAT TRANSFER IN NATURAL CONVECTION

M. SCHERBERG

/65- /

DOD-AIR FORCE

****

GOF 207493 FIELD 13+, 9+, 9C, 9A

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

ARC RETROGRADE MOTION

M. SCHRADE

/65- /

DOD-AIR FORCE

****

GOF 207494 FIELD 12A,13M,20M,20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

ELECTRIC ARC COLUMN IN TRANSVERSE MAGNETIC AND FLOW FIELDS

M. ROMAN

/65- /

DOD-AIR FORCE

****

GOF 207503 FIELD 12A,13M,20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

RAREFIED GAS STUDIES

R. KORKEGI

/65- /

DOD-AIR FORCE

****

GOF 207504 FIELD 12A,13M,20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

VISCOUS FLOW INTERACTION STUDIES

R. KORKEGI

/65- /

DOD-AIR FORCE

****

GOF 207505 FIELD 12A,13M,20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

SEPARATED FLOW STUDIES

W. MANKEY

/65- /

DOD-AIR FORCE

****

GOF 207510 FIELD 7D, 7A,20M,11B

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

THERMODYNAMIC STUDIES OF METAL AND OXIDE SYSTEMS

L. BIDWELL

/65- /

DOD-AIR FORCE

****

GOF 207512 FIELD 20L

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

X-RAY DIFFRACTION STUDIES

M. GARRETT

/65- /

DOD-AIR FORCE

****

GOF 207513 FIELD 20M,20L, 7B

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

ELECTRICAL AND MECHANICAL PROPERTIES OF SELECTED OXIDES AND HALIDES

N. TALLAN

/65- /

DOD-AIR FORCE

****

GOF 207517 FIELD 7D,12A,20L,20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

REACTIN GAS FLOW TABLES

R. SHANAMAN

/65- /

DOD-AIR FORCE

****

GOF 207524 FIELD 12A,13M,20L,20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

WALL-INJECTION NOZZLE STUDIES

J. STEURER

/65- /

DOD-AIR FORCE

****

GOF 207527 FIELD 20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

RESEARCH ON SUPERPRESSURE TECHNIQUES

A. WENNERSTROM

/65- /

DOD-AIR FORCE

****

GOF 207529 FIELD 20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

TEMPERATURE MEASURING TECHNIQUE FOR HYPERSONIC FLOWS

R. DUNN

/65- /

DOD-AIR FORCE

****

GOF 207530 FIELD 20D,20J,20F

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

STUDY OF SCHLIEREN AND INTERFEROMETER TECHNIQUES FOR FLOW VISUALIZATION

A. WENNERSTROM

/65- /

DOD-AIR FORCE

****

GOF 207531 FIELD 20M,20D,10B, 7B

NEW YORK UNIVERSITY, GRADUATE SCHOOL MATHEMATICS, NEW YORK

SUPERSATURATION IN HYPERSONIC FLOWS

F. DAUM

/65- /

DOD-AIR FORCE

****

GOF 207541 FIELD 12A,13M,20D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

STUDY OF TURBULENCE AND ITS ONSET

J. LEE

/65- /

DOD-AIR FORCE

****

GOF 207553 FIELD 20J,20F,20I, 7B

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

LOW DENSITY PLASMA DYNAMICS

A. GARSCADDEN

/65- /

DOD-AIR FORCE

****

GOF 207557 FIELD 12A,20M,18A, 7D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

INVESTIGATION OF NUCLEAR LEVAL SCHEMES

G. HARRIS

/65- /

DOD-AIR FORCE

****

GGF 207559 FIELD 12A,20H,18A

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

PION PHYSICS

C. POIRIER

/65- /

DOD-AIR FORCE

****

GGF 207564 FIELD 12A,20H,20J

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

CONSTRAINT CONDITIONS IN THE QUANTIZATION OF FIELDS

D. SHANKLAND

/65- /

DOD-AIR FORCE

****

GGF 207567 FIELD 12A,20H,20J

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

RESEARCH IN GAUGE-TYPE FIELD THEORIES

S. FICKLER

/65- /

DOD-AIR FORCE

****

GGF 207571 FIELD 20H,11G,20L, 7B

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

REACTION OF SEMICONDUCTORS TO ELECTRON BOMBARDMENT

B. KULP

/65- /

DOD-AIR FORCE

****

GGF 258805 2 FIELD 4A, 8-, 9-,12A

BOSTON COLLEGE, GRADUATE SCHOOL, MATHEMATICS, MASSACHUSETTS

THEORETICAL RESEARCH ON DUCT PROPAGATION OF RADIO WAVES CAUSED BY REFRACTIVE INDEX ANOMALIES

R. M. RING

AF-19-628-02772
/65- /

DOD-AIR FORCE

****

GGF 258870 2 FIELD 12A,20H, 5A,20J

BOSTON UNIVERSITY, GRADUATE SCHOOL, PHYSICS, MASSACHUSETTS

INVESTIGATION OF INVARIENCE PROPERTIES OF QUANTUM ELECTRODYNAMICS FROM A TOPOLOGICAL POINT OF VIEW

M. SACHS

AF-19-628-02816
/65- /

DOD-AIR FORCE

****

GGF 258414 1 FIELD 20J, 5A,20D,20L

BOSTON COLLEGE, GRADUATE SCHOOL, PHYSICS, MASSACHUSETTS

INVEST PHYSICAL MECHANISMS ASSOCIATED WITH GROWTH + PERFECTION OF SINGLE CRYSTALS OF ELECTRONIC MATS

J. W. CHEN

AF-19-628-04041
/65- /

DOD-AIR FORCE

****

GGF 258442 1 FIELD 23F,20L

LAB OF PLASMA PHYSICS, FRANCE

STUDY NATURE + ROLE OF IMPURITIES + IMPERFECTIONS ON SEMICON PROPS BY OPTICAL + MAGRESONANCE SPECTRO

M. BALKANSKI

AF-61-052-00789
/65- /

DOD-AIR FORCE

****

GGF 258444 1 FIELD 20J, 5A,20L

NORTHEASTERN UNIV, GRADUATE SCHOOL, PHYSICS, MASSACHUSETTS

THEORET INVEST OF THE PHYSICS UNDERLYING THE PHENOMENON OF MAGNETIC ANISOTROPY

W. HAUSER

AF-19-628-03811
/65- /

DOD-AIR FORCE

****

GGF 258454 3 FIELD 20H,11B, 5A,20F

MASS INST OF TECHNOL, GRADUATE SCHOOL, PHYSICS, MASSACHUSETTS

INVESTIGATION ON THE GROWTH + PROPERTIES SUCH AS HARDNESS ELEC OPTICAL OF HI-TEMP SINGLE CRYSTALS

A. SHAKULA

AF-19-628-03395
/65- /

DOD-AIR FORCE

****

GGF 258542 1 FIELD 12A,20H,20F

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK

THEORETICAL RESEARCH ON CLASSICAL ELECTROMAGNETIC THEORY + CONCEPTS

M. KLINE

AF-19-628-03868
/65- /

DOD-AIR FORCE

****

GGF 258557 1 FIELD 5A,20L

THEORETICAL + EXPERIMENTAL RSCH ON FERROELECTRIC + FERROMAGNETIC PHENOMENA IN SOLIDS

R. V. JONES

AF-19-628-03874
/65- /

DOD-AIR FORCE

****

GGF 258684 2 FIELD 3A, 5A,20F,20I

YESHIVA UNIVERSITY, GRADUATE SCHOOL, PHYSICS, NEW YORK

STUDY OF RELAVISTIC PLASMAS AND MEASUREMENT OF THEIR CHARACTERISTICS

D. FINKELSTEIN

AF-19-628-02399
/65- /

DOD-AIR FORCE

****

GGN 530486 FIELD 1C, 1B,13J,20D

STEVENS INST OF TECH, GRADUATE SCHOOL, NEW JERSEY

HYDRODYNAMIC TOWING TANK INVESTIGATIONS

, NONE

N600-19-59107
/65- /

DOD-NAVY

****

GGN 544106 FIELD 12A,13H,20K

STATE UNIV N Y BUFFALO, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, NEW YORK

BI-AXIALLY LOADED TAPERED COLUMNS

R. L. KETTER, R. W. EWELL

NBY63864
/65- /

DOD-NAVY

****

ZOA 25 FIELD 11G,11D,12A,13H

USA, ORD CORPS, WATERVLIET ARSNL, NEW YORK

STRESSES IN LAYERED MEDIA

S. BECK

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZOA 139 FIELD 13-, 9-, 9A,20L

USA, ORD CORPS, WATERVLIET ARSNL, NEW YORK

STRAIN GAGE RESPONSE UNDER SUPERIMPOSED HYDROSTATIC PRESSURE

V. MILLIGAN

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZOA 140 FIELD 11F,13H,11G

USA, ORD CORPS, WATERVLIET ARSNL, NEW YORK

ANELASTIC RELAXATION

L. MIESEL

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZOA 168 FIELD 12A,20H,20J,20L

USA, ORD CORPS, WATERVLIET ARSNL, NEW YORK

THEORETICAL BAND STRUCTURES

A. MARCUS

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZOA 243 6 FIELD 20L,20J

USA, ORD CORPS, WATERTOWN ARSNL, MASSACHUSETTS

ELECTRON-PHONON INTERACTIONS IN SOLIDS AND THEIR RELATION TO DISCONTINUITIES IN METALS

R. J. HARRISON

/65- /

ARMY-ORDNANCE ARSENAL-FRANKFORD, PHILADE

****

ZQF 207873 2 FIELD 20D,10B

USAF, ARNOLD AFS, TENNESSEE

SUPERSONIC COMPRESSOR RESEARCH

C. T. CARMEN

AF-40-600-01000
/65- /

DOD-AIR FORCE

****

ZQF 260010 FIELD 7D,20J,18A,20D

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

ANALYSIS OF ELECTROMAGNETIC MATERIALS

J. P. CALI

/65- /

DOD-AIR FORCE

****

ZQF 260014 FIELD 11B,20L,20J, 7B

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

SINGLE CRYSTAL PROPERTIES

E. P. CZERLINSKY

/65- /

DOD-AIR FORCE

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ZQF 260538 FIELD 9+,20F,20L

USAF, OAR, AFCRL, HANSCOM, BEDFORD, MASSACHUSETTS

E M INTERACTIONS WITH PHONONS AND MAGNONS

M. H. SEAVEY

/65- /

DOD-AIR FORCE

****

ZQF 284604 2 FIELD 9+, 9A,20F,20L

USAF, OAR, ARL, WRIGHT-PATT-APPL MATH, OHIO

THIN FILM PROPERTIES

J. M. BLASINGAME

/65- /

DOD-AIR FORCE

****

ZQF 284611 7 FIELD 9+,20F,20I

USAF, OAR, ARL, WRIGHT-PATT-APPL MATH, OHIO

ENERGY MECHANISMS IN PLASMAS

G. K. MEDICUS

/65- /

DOD-AIR FORCE

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ZQF 284710 FIELD 7D,20M,11F,11G

USAF, AFSC, RTD, WRIGHT-PATT-AF MAT LAB, OHIO

DEFECT STRUCTURES IN PROPERTIES OF FACE-CENTERED CUBIC METALS

H. L. GEGEL

/65- /

DOD-AIR FORCE

****

ZQF 284748 3 FIELD 9+, 9A,20L

USAF, AFSC, RTD, WRIGHT-PATT-AF MAT LAB, OHIO

SUPERCONDUCTOR RESEARCH

D. J. EVANS

/65- /

DOD-AIR FORCE

****

ZQF 284749 2 FIELD 7D,20F,20I,20L

USAF, AFSC, RTD, WRIGHT-PATT-AF MAT LAB, OHIO

SPECTRAL STUDIES RELATED TO THERMODYNAMICS OF PLASMA AND CRYSTALS

E. RUTNER

/65- /

DOD-AIR FORCE

****

ZQF 284779 7 FIELD 20D,10B,20F,20I

USAF, ARNOLD AFS, TENNESSEE

MAGNETOGASDYNAMICS EXPERIMENTS

W. K. MCGREGOR

AF-40-600-01000
/65- /

DOD-AIR FORCE

****

ZQF 284795 2 FIELD 7D, 7C,12A, 7B

USAF, AF ACADEMY, ACADEMY, COLORADO

AN INVESTIGATION OF THE SYSTEM NB2O5-SC2O3

W. E. SCHAEFER

/65- /

DOD-AIR FORCE

****

ZQF 284804 1 FIELD 12A,13M,20D,20K

USAF, AF ACADEMY, ACADEMY, COLORADO

SOLUTION OF THE DIFFUSION EQUATION WITH A FREE BOUNDARY IN CYLINDRICAL AND SPHERICAL BODIES

D. J. MANCI

/65- /

DOD-AIR FORCE

****

ZQF 284885 1 FIELD 20+, 9+, 9A,11F

USAF, AF ACADEMY, ACADEMY, COLORADO

COLD-WIRE INSTRUMENT IN EXTREMELY FAST HEAT-TRANSFER PROBLEM

C. F. STEBBINS

/65- /

DOD-AIR FORCE

****

ZQF 284898 FIELD 20+, 9+, 9A,11G

USAF, AF ACADEMY, ACADEMY, COLORADO

END WALL RESPONSE TO IMPINGING SHOCK WAVE IN A SHOCK TUBE

D. S. JOHNSON

/65- /

DOD-AIR FORCE

****

ZQF 420546 1 FIELD 20L,20D,20F,20I

USAF, ARNOLD AFS, TENNESSEE

GAS VELOCITY BY MICROWAVE TECHNIQUES

J. CUNNINGHAM

AF-40-600-01000
/65- /

DOD-AIR FORCE

****

ZQN 530708 FIELD 20D

USN, BUR SHIPS, CARDEROCK-D T MOD BAS, MARYLAND

RAIN EROSION WEDGE SUPERSONIC CHARACTERISTICS

R. BROBERG

/65- /

DOD-NAVY

****

ZQN 544153 FIELD 20L,20K

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

LONG RANGE OBSERVATIONS--CREEP

D. F. GRIFFIN, J. R. KEETON

/65- /

DOD-NAVY

****

ZQN 544182 FIELD 9+,20D

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

PORTABLE ACOUSTICAL MEASUREMENT SYSTEM

M. LOUK

/65- /

DOD-NAVY

****

ZQN 544191 2 FIELD 15+, 9+,12A,20F

USN, BUR YDS + DOCKS, PORT HUENEME, CALIFORNIA

ELECTROMAGNETIC CROSS SECTIONS OF MATERIAL

H. A. LASITTER, D. B. CLARK

/65- /

DOD-NAVY

****

ZUA 789 1 FIELD 13G,14B,20D

MECHANICS OF FLUID RESISTANCE

H. J. TRACY

ASA-33-F
/66- /

INTERIOR-GEOLOGICAL SURVEY

****

ZUG 592 1 FIELD 11F,13H,20C,20I

USDI, BUR MINES, ALBANY, OREGON

ELECTRICAL DISCHARGES IN PLASMAS

A. M. ROBERSON, R. A. BEALL, F. W. WOOD

INT-BM-4157-9
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 607 1 FIELD 7D, 7C,11F,13H

USDI, BUR MINES, RENO, NEVADA

ELECTROMIGRATION OF IMPURITIES IN RARE-EARTH METALS

T. A. HENRIE, T. R. GRAHAM

INT-BM-4158-15
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 634 1 FIELD 7A, 7D,20A, 7B

USDI, BUR MINES, BARTLESVILLE, OKLAHOMA

ULTRASONIC VELOCITY IN COMPRESSED GASES

D. R. DOUSLIN, J. S. BALL, B. GAMMON

INT-BM-13-WD-65-200
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 720 1 FIELD 5A,20L, 7B

USDI, BUR MINES, ALBANY, OREGON

COLUMBIUM AND TANTALUM ALLOYS - (B) SUPERCONDUCTING ALLOYS

H. KATO, D. K. DEARDORFF, L. L. ODEN
R. E. SIEMENS

INT-BM-4157-48
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 850 FIELD 7C, 7D,20M, 7B

USDI, BUR MINES, AMARILLO, TEXAS

DETERMINE HEAT TRANSFER REGIMES, CRYOGENIC FLUIDS

R. E. WOOD, F. W. BAER, W. J. BOONE
J. D. MARSHALL, R. W. TALIAFERRO

INT-BM-4774
/66- /

INTERIOR-BUREAU OF MINES

****

ZUG 868 FIELD 20M,20D,20J

USDI, BUR MINES, BARTLESVILLE, OKLAHOMA

THERMODYNAMIC PROPERTIES OF COMPRESSED GASES - AFOSR

D. R. DOUSLIN, J. S. BALL, W. R. ESTLIN
R. H. HARRISON, R. T. MOORE

INT-BM-6-4166-1100
/66- /

INTERIOR-BUREAU OF MINES

21 PROPULSION AND FUELS

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GQF 491 8 FIELD 21B,21I, 7D,14E

POLYTECH INST BROOKLYN, SCHOOL OF ENGINEERING, AERO. ENGR. + APP. MKI, NEW YORK

HIGH FREQUENCY OSCILLATORY COMBUSTION

V. D. AGOSTA

AF-49-638-01263
/65- /

DOD-AIR FORCE

****

GQF 423 10 FIELD 7C, 7D,21B,21D

UNIVERSITY OF LOUVAIN, BELGIUM

REACTION KINETICS IN FLAMES

A. VANTIGGELEN

AF-EOAR-0042-63
/65- /

DOD-AIR FORCE

****

GQF 2367 4 FIELD 21B,21D, 7A, 7D

GEN APPLIED SCIENCE, F LAB, WESTBURY, NEW YORK

SUPERSONIC COMBUSTION RESEARCH

A. FERRI

AF-49-638-01503
/65- /

DOD-AIR FORCE

****

PAR 16 FIELD 21B,21D,20M,10B

NEW APPROACHES TO FLAME DETECTION

R. J. ZIELINSKI

1/66-12/66

ASSOCIATION OF AMERICAN RAILROADS

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YND 60 FIELD 7C,21D

A STUDY OF THE UTILIZATION OF BY-PRODUCTS FROM LIGNITIC CHAR PRODUCTION

P. JOHNSON, F. L. MINNEAR, D. SCHWARTZ

/66- /

STATE-NORTH DAKOTA

****

ZQF 284413 FIELD 7C,21B,21D, 7D

USAF, ARNOLD AFS, TENNESSEE

COMBUSTION IN HIGH VELOCITY DIFFUSIVE FLOW

R. P. RHODES

AF-40-600-01000
/65- /

DOD-AIR FORCE

****

ZUG 854 FIELD 13A,19D,21B,21C

USDI, BUR MINES, SCHUYLKILL, PENNSYLVANIA

COMBUSTION OF PULVERIZED ANTHRACITE

F. M. DRAKE, G. B. STEVENSON

INT-BM-111151110
/66- /

INTERIOR-BUREAU OF MINES

22 SPACE TECHNOLOGY

****

GH 536 3 FIELD 20J,20C, 5A,20F

CAL INST OF TECHNOLOGY, GRADUATE SCHOOL, PHYSICS, CALIFORNIA

SPACE RELATED RESEARCH IN SELECTED FIELDS OF PHYSICS AND ASTRONOMY

R. B. LEIGHTON, R. BOZT, A. F. CHRISTY
L. DAVIS, G. MUNCH, H. V. NEBER
G. NEUGEBAUER

NSG-426
4/66- 3/67

NASA

****

GH 1758 FIELD 22A, 5E,22D

RAND CORPORATION, SANTA MONICA, 60, OBS, CALIFORNIA

CONDUCT A STUDY PROGRAM TO ASSIST IN DEFINING AN INTEGRATED CHECKOUT SYSTEM FOR MANNED MISSION COMPLEXES

. NONE

NASR-21(08)
12/64-12/65

NASA

****

GH 1843

VA ASSOCIATED RES CTR, RICHMOND, VIRGINIA

A SUMMER INSTITUTE IN SPACE-RELATED ENGINEERING

E. C. STEVENSON

NSR-47-007-003
3/65- 3/66

NASA

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GQF 2377 4 FIELD 22B,22A,22C,17C

UNIVERSITY OF LOUVAIN, BELGIUM

INFLUENCE OF STRUCTURAL ELASTICITY ON ATTITUDE STABILITY AND DRIFT OF SPACE CRAFT

F. BUCKENS

AF-EOAR-0066-65
/65- /

DOD-AIR FORCE

****

GQF 2635 4 FIELD 22C, 3A, 8D,20F

UNIVERSITY OF BERN, SWITZERLAND

RADIATION EFFECTS IN SPACE

F. G. HOUTERMANS

AF-EOAR-0077-65
/65- /

DOD-AIR FORCE

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ZQF 280060 FIELD 22B,22A,22D,17C

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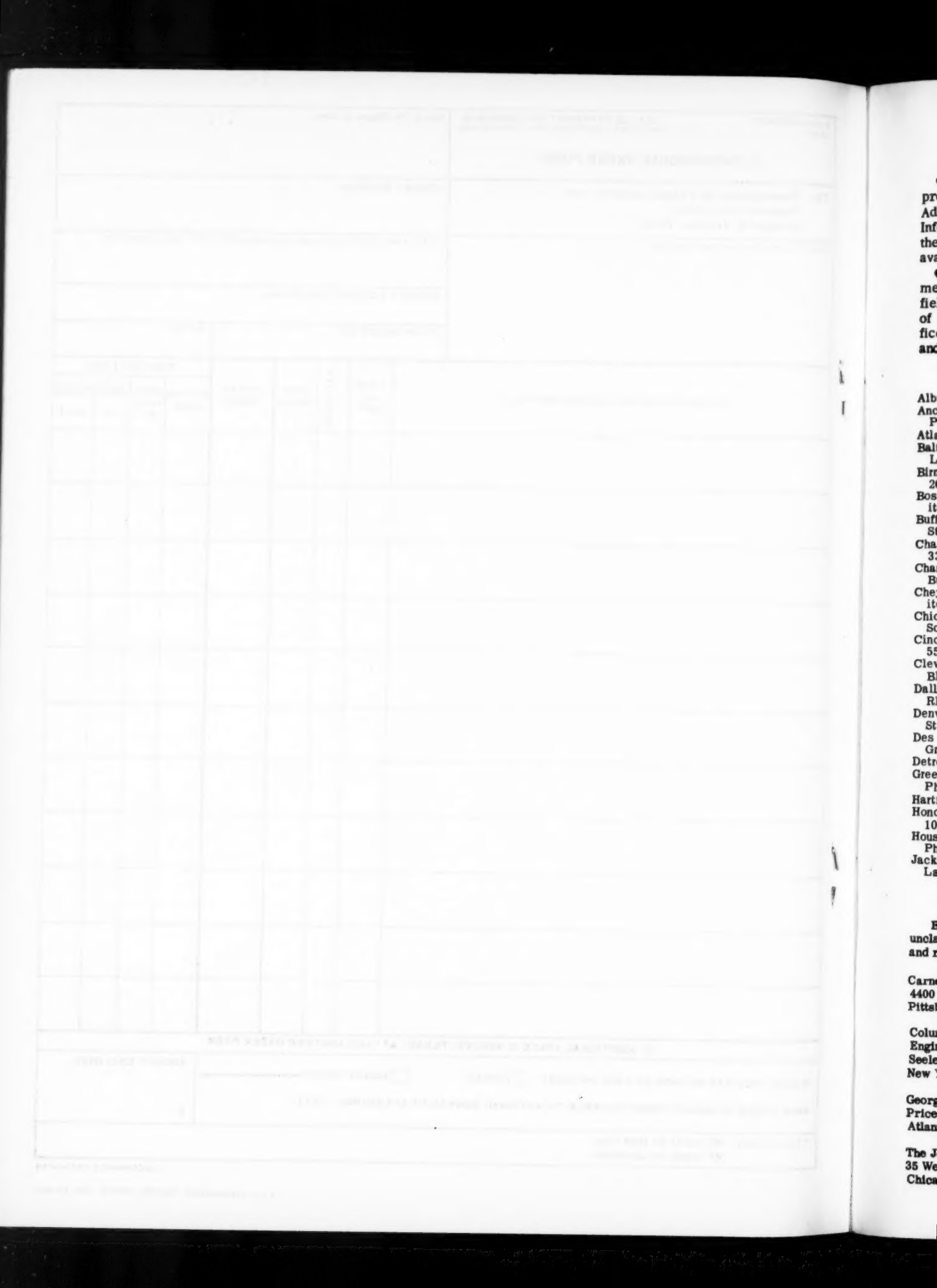

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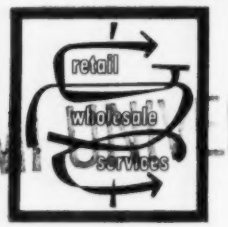
1963 CENSUS OF BUSINESS



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